Eng Lit.
Faxon

GENERAL INDEX.

(Illustrated Subjects are Marked with an Asterisk after the Number of the Page.)

A

A. C. E. Machinery, Ltd., Concrete Mixer, 509*
Abetti, Prof. A., the Late, 446
Abrasives, Corundum and Garnet, Canadian Sources, Properties and Uses, 29
— Siliceous, in Canada, Report, 519
Abutment Towers, Sydney Harbour Bridge, Design and Construction, 467*
Acceptance Tests, International, Steam Turbines, 709

Accidents :

Boiler Explosions, Board of Trade Inquiries, 352, 518
— Failures, Report on, 386
Dam, St. Francis, Los Angeles, Failure of, 419*, 452*, 547, 580, 644
Explosion, Bitumen-Laid Cable, Royal Institution, 89
— Boiler. See *Boiler Explosions* and PARAGRAPH INDEX
Phosgene, Escape of, at Hamburg, 668
Railway Accidents, Sevenoaks and Bearsted, Southern Railway, Reports, 138
Safety Precautions, Economic Value of, 77
Shipping, Vessels Lost, 372
Accumulators, Electric. See *Electric*
— Hydraulic, Williams-Janney Pump, 288*
Vehicles. See *Motor Truck*
Acetylene and Welding Association, British. Autogenous Welding of Stainless Steel, by H. Bull and L. Johnson, 478
— Welding. See *Welding*
Acid Process, Extraction of Alumina, 375
Acoustics, Gramophone Sound-Recording and Reproducing Apparatus, Progress, 400*
— Sound Transmission through Building Materials, 368
Activated Sludge. See *Sewage*
Acton Overhaul Works, London Underground Railways, 645*
Adams, A. S., on Gas Sorption in Flotation, 818
Address, Presidential. See *Presidential Address*
Administration of Electricity Supply Undertakings, 737
Admiralty Engineering Laboratory, Experimental Investigations, Diesel Engines, 407, 425*, 462*
— Experimental Work, Pre-War and Present Costs, 687
— See also *Warships*
Aerial Navigation. See *Aeronautics*
— Propellers. See *Propellers* under *Aeronautics*
— Survey of Rio de Janeiro, 486
— Surveying, Photographic, Treatise on (Review), 141
— Transport See *Aeronautics*
Aerocrete Light Concrete, 700
Aerodrome. See *Aeronautics*
Aerodynamics. See *Aeronautics*
Aeronautical Society, Royal. High-Speed Heavy Oil Engines, by H. B. Taylor, 229 ; The Variable-Pitch Airscrew, by Dr. H. S. Hele-Shaw, and T. E. Beacham, 489*

Aeronautics :

Aerial Survey of Rio de Janeiro, 486
Aerodrome, Croydon, Wireless Equipment, 190*
Aerodynamics in Aeroplane Design (Review), 371
— Behaviour of Curved Bodies in Air Stream, 644
Aeroplane Design, Aerodynamics (Review), 371
— See also *Seaplane* (below)
Air Estimates and Aeronautical Progress, 325
— Stream, Behaviour of Curved Bodies in, 644
Aircraft-Apprentice Training Scheme, 263
— Carrier, H.M.S. " Courageous," 257*
— Classification of, Work of British Corporation, 257
— Construction, Steel for, 695
— in Naval Warfare (Review), 692. See LETTER, 771
Airship R 101, Design and Construction, 437, 457*. See 325
Apprentice-Training Scheme, Royal Air Force, 263

Aeronautics—*continued.*

Aviation in United States Navy, 88
Busk Studentship in Aeronautics, 487
Civil Aviation, Position and Prospects, 325
— — in Russia, 172
— — Southampton as an Air Port, 809
— — See also *Airships* (above)
Croydon Aerodrome, Wireless Equipment, 190*
Engines, Petrol, Aeroplane, Air-Cooled, Heat Control and Increased Output, 778
— — Aeroplane, Development of, 633*, 752. See 727
— — Aeroplane, Napier-Lion, for Schneider Trophy Race, 632*
— — Aeroplane, Racing Types, Increase in Power, Speed and Compression Ratio, 633*
Propeller, Aerial, Variable-Pitch, Gloster Hele-Shaw Beacham 489*
— Model, in Air and Water, Comparisons, 409
Research, Aeronautical, and the Air Estimates 325
Royal Air Force, Education in, 263 ; Estimated Expenditure, 325
Russia, Commercial Aviation in, 172
Seaplane Flight Round Africa, Sir A. Cobham, 740
Southampton, Use as Air Port, 809
Survey, Aerial, of Rio de Janeiro, 486
Surveying, Aerial, Photographic, Treatise on (Review), 141
See also PARAGRAPH INDEX

Aeroplanes. See *Aeronautics*
Africa, East, Trade and Commerce of, Report, 273
— Northern, Report on Trade and Transport Facilities, 130
— River Congo, Proposed Water Power Development, 685
Agreements, Labour. See *Labour*
Agricultural Hall. See *Exhibition*
— Machinery Industry, Position and Prospects, 324
— — Tendencies in, 778
— Motors. See *Engines ; Motors ; Tractors*
— Tractors. See *Tractors*
Agriculture, Electricity in (Review), 693
— Hydraulic Traction Dynamometer for Ploughing, 538*
— Nitrogenous Fertilisers, British Investigations, 643
— Use of Machinery in, 811
— See also *Irrigation* and PARAGRAPH INDEX
Agua Fria River, Arizona, Multiple-Arch Dam, 159*
Air, Atmospheric, Ionisation of, 546
— Compressed. See *Compressed Air ; Pneumatic*
— Compressor, Hand-Operated (Reavell & Co., Ltd.), 222*
— — Rotary, Rolling-Drum Type (Reavell & Co., Ltd.), 222*
— Coolers, for Turbo Generators, Trenton Channel Power Station, 606*
— Ejectors, Two-Stage, Metropolitan-Vickers Electrical Co., Ltd., 659*
— Estimates and Aeronautical Progress, 325
— Preheaters, Howden-Ljungström, Shanghai Power Station, 685
— — Marine Boilers, Advantages, 323. See LETTER, 351
— Pump. See *Pump*
— Screws. See *Propellers* under *Aeronautics*
— Stream, Behaviour of Curved Bodies in, 644
— See also *Atmosphere*
Aircraft Carriers. See *Aeronautics*
Aircraft Operating Co., Ltd., Aerial Survey of Rio de Janeiro, 486
— See *Aeronautics*
Airships. See *Aeronautics*
Alcohol, Power, from Vegetable Materials, Report on, 78
Algeria, Economic and Commerical Conditions, Report, 130
Alignment Charts, Flow of Viscous Liquids through Pipes, 498*
Allen, J., & Sons (Oxford), Ltd., Hand Barrow with Creeper Track, 224*
Allen, W. H. Sons & Co., Ltd., Turbo-Generators, H.M.S. " Rodney," 375* ; Diesel-Engine Generating Sets, S.S. " Duchess of Bedford," 675*
Allgemeine Elektrizitäts Gesellschaft, Klingenberg Power Station, 58 ; Three-Phase Motor, 329*
Allibone, Dr. T. E., on Zirconium Alloys, 315
Allowances in Machine Work. See *Gauges ; Gauging*
Alloys. See *Metallurgy ; Microphotographs ;* PARAGRAPH INDEX
Alpine Cloud Forms, 540
Alsace-Lorraine Railway Workshops, Liquid Oxygen for Cutting and Welding, 694*
Alsop-en-le-Dale Quarries, Petrol Shunting Locomotive, 8*
Alternating Current. See *Electric*
— Stress. See *Tests (Materials)*
Alternators. See *Generators, Electric ; Turbo-Generators*
Altoona Locomotive Testing Plant, Experimental Results on Three-Cylinder Compound Engine, 103
Alumina, Acid Process of Extracting, 375
Aluminium Alloys. See *Alloys* under *Metallurgy*
— and Aluminium Alloys, Dilatometric Investigations, 297, 337*
— Behaviour During Hot Forging, 331*. See 313
— See also *Metallurgy ; Metal-Price Diagrams*
American Concrete Institute. See *Concrete Institute, American*
— Institute of Electrical Engineers. See *Electrical Engineers*
— Institute of Mining and Metallurgical Engineers. See *Mining and Metallurgical Engineers*
— Navy. See *United States* under *Warships*
— Society of Civil Engineers. See *Civil Engineers*
— Society of Mechanical Engineers. See *Mechanical Engineers*
— Society of Naval Architects and Marine Engineers. See *Naval Architects*
— Society for Testing Materials. See *Testing Materials*
— See also *United States*
Ammonia Compressors (R. Boby, Ltd.), 226*
— Compressors (Pulsometer Engineering Co., Ltd.), 223*
— Synthetic, German Industry, 536
Ammonium Nitrate, Changes in, 655
Ammunition, Season Cracking of Cartridge Cases, 304*, 312
Analysis, Ferrous Metals, Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 122*
— of Opal Glass, 487
Anchor Liner " Britannia," Bauer-Wach Exhaust-Turbine Drive, 206
Anderson, J., Operating Experiences with 1,300-lb. Steam Pressure, 25*, 55*
Andrade, Prof., on Science and the Work of the Engineer, 169. See LETTER, 227
Andreau Differential-Stroke Petrol Engine, Kinematics of, 277*
Angle Rings, Bending Machine for, 256
Annealing. See *Heat Treatment* under *Metallurgy*
Annual Publications. See LITERATURE INDEX
Anti-Friction Metals. See *Alloys* under *Metallurgy*
Antimony Alloys. See *Alloys* under *Metallurgy*
— Prices. See *Metal-Price Diagrams*
Apparatus, Scientific, Physical and Optical Societies, Exhibition, 49*, 68*, 101*. See 142, 175, 237*, 400*
Appleby Iron Co., Ltd., Iron and Steel Plant, 551*, 584*. See 578
Applied Thermodynamics, Treatise on (Review) 780
Appointments. See PARAGRAPH INDEX
Apprentice Training Scheme, Royal Air Force, 263
Apprenticeship System, Metropolitan-Vickers Electrical Co., Ltd., 817
— See also *Education*
Approach Spans, Sydney Harbour Bridge, Design and Construction, 467* See *Erratum*, 540
Arbitration in Labour Disputes. See *Labour* and PARAGRAPH INDEX
Arc. See *Electric ; Furnace ; Welding*
Arch Bridge, Ferro-Concrete, River Tweed, Berwick, 527*, 615*
— — Steel, Newcastle-on-Tyne, Erection, 266*
— — Optical Determination of Stresses, 810*. See 709
— — See also *Sydney Harbour Bridge*
— Dam, Lake Pleasant, Arizona, 159*
— Liptak, Boiler Furnaces, Trenton Channel Power Station, 500*
Architects, Naval. See *Naval Architects*
— Training of, 263
Arcing, Pressures Produced in Closed Vessels 715
Argentine, Commercial, Economic and Financial Conditions, Report, 108
Arizona, Lake Pleasant Multiple-Arch Dam, 159*
Armaments and the Non-Combatant (Review), 692. See LETTER, 771
Armature Coils, Manufacture, Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 405*, 731*
— Electric Motor, London Electric Railways, Repairs at Acton Works, 647
Armco Iron, Creep at High Temperatures, 672
Armoured Ships. See *Warships*
Armstrong, Whitworth & Co., Ltd., Lathe for Motor-Car Axles, 160*
Arrol, Sir W. & Co., Ltd., Royal Edward Dock Extension, Avonmouth, 565*, 591*. See 644
Art and Technology, 779
Arterial Roads. See *Roads*
Artificers, Engine-Room, British Navy, Promotion of, 674
Artificial Daylight, Production and Properties, 142
Arts, Royal Society of, Radiant Heating, by A. H. Barker, 139. See 791 ; Indo-European Telegraph Department, by M. G. Simpson, 209* ; Cantor Lectures on Fatigue Phenomena, by Dr. H. J. Gough, 200, 232, 264
Ash Handling, Water-Sluice System, Trenton Channel Power Station, 502*
Assessment of Industrial Premises and Plant for Rating, 258, 775
Association, British. See *British Association*
— Engineering. See *Institutions*
Astronomical Exhibits, Royal Society Conversazione, 643
Astronomy, Accuracy in Time Measurement, 612
— Physics in, 612
— Solar Constant, Determination of, 612
— Sun's Cycle of Activity, 455
Atkinson-Cycle Petrol Engine, Citröen Gear Co., Kinematics of, 277*
Atlantic Liners. See *Steamers*
— North, Western Ports of. Boston, 34*, 97* Quebec, 183*
Atmosphere, Ionisation of, 546
Atmospheric Corrosion of Metals, Electrical Resistance Measurements, 338
— Dust in Mines, Sampling, Impinger-Plate Method, 290
— Moisture, Electrical Measurement, 487
Atoms, Transformations of, 315*, 360*, 387*, 422*
Auld, Lieut.-Col. S. J. M., on the Exploitation of Natural Gas, 341
Australia, Registration of Engineers in, 780
— Sydney Harbour, Double-Ended-Screw Passenger Steamers, 397*, 408
— — Harbour Bridge. See *Sydney Harbour*
— Trade and Industries of, Report, 417
Autogenous Welding. See *Welds ; Welding*
Automatic Boiler Control, Hagan System, 382
— Control Gear, Hydraulic Turbines, 793*
Automatic and Electric Furnaces, Ltd., Wild-Barfield High-Temperature Furnace, 101 ; Exhibits at British Industries Fair, 252
— Machine Tools. See *Machine Tools*
— Plumber for Jointing Lead-Sheathed Cables, 254*
— Regulator for Vulcanisers (Drayton Regulator and Instrument Co., Ltd.), 460*
— Signalling. See *Signalling*
— Stokers. See *Stokers*
— Temperature-Control Apparatus, Steam and Water, Crosby, 273*

Automatic Tilting Weirs, Lanarkshire Water Power Plants, 767*
Automobile Engineers, Institution of, High-Speed Heavy-Oil Engines, by H. B. Taylor, 229; Award of Institution Medal, 478
— See *Motor Cars*
Auxiliary Machinery, Marine. See *Marine*
Averaging Recorder, Electric Power Supply, 393*
Avery, W. & T., Ltd., Grain-Weighing Machines, Avonmouth Docks, 596*, 597*; 1,250-ton Testing Machine, Sydney Harbour Bridge Members, 697*
Aviation. See *Aeronautics*
Avonmouth, Royal Edward Dock Extension, 565*, 591*. See 644
Axle Box, Locomotive-Driving, Floating-Bush Type, 473*. See 347*
— Journals, Railway Rolling-Stock, Grinding Machine for, 637*
— Motor-Car. See *Motor-Car Details*
— Railway, Magnetic Detector for Cracks, Acton Works, 646
Azed Water-Softening Plants, 483

B.

BAILEY, F. J., on Correlation of Blast-Furnace Data, 577
Bailey, G. L., on Dissolved Gases in Brass, 366*. See 313
Baird, A. W., the Late, 142
Baird & Tatlock, Ltd., Exhibits at Physical and Optical Societies' Exhibition, 101; Sodium-Peroxide Bomb Calorimeter, 623*
Baker, G. S., Experiments on Propulsion of Single-Screw Ship Model, 461*. See 438
Baker-Type Locomotive Valve Gear, 347*
Balance, Spring, 100-ton, for Cranes, 256*
Balancing Machine, Dynamic, Turbine Rotors, Metropolitan-Vickers Electrical Co., Ltd., 657*
Baldwin Locomotive Works, Three-Cylinder Compound Locomotive, Experimental Results, 103
Ball Bearings. See *Bearings*
— Hardness Tests. See *Hardness* under *Tests* (*Materials*)
Baluchistan, Telegraph System of, 209*
Band Conveyors. See *Conveyors*
Bari, Italy, Harbour Construction Works, 245*. See *Addendum*, 382
Bars, Steel, for Machined Parts, Standard Specification, 185
Barker, A. H., on Radiant Heating, 139. See 791
Barking Power Station, Jetty and Pump-House Construction, 319; Carbon-Dioxide Fire-Extinguishing Installation, 441*
Barrels, Inspection Lamp for (Ceag, Ltd.), 253*
— Washing Machine for (Mather & Platt, Ltd.), 195*
Barrow, Hand, with Creeper Track, 224*
— Wheel, Transporting Bricks by, Fatigue Investigations, 817
Barton, D. C., on Mapping Geological Structures by the Eötvös Torsion Balance, 696
Base-Line Measurement, Catenary and Mechanical Methods, 559*
Basic Process, Steel Manufacture, Development of, 808
Bath Meeting, Incorporated Municipal Electrical Association. See *Municipal*
Batson, R. G. G., on Materials for Use at High Temperatures, 723. See 702, 728
Batteries. See *Electric*
Battery Vehicles. See *Motor Truck*
Battleships. See *Warships*
Bauer-Wach Exhaust Turbine Drive, S.S. "Britannia," 206
Beacham, T. E., on the Variable-Pitch Air-screw, 480*
Beale-Hele-Shaw Filter, Oily Bilge Water, Japanese Navy, 150*
Beam Test, Strength of Concrete, 495
Beames, Capt. H. P. M., on Crewe Locomotive Works, 362*. See 355, 358. See *Errata*, 414
Beardmore, W., & Co., Ltd., Bauer-Wach Exhaust Turbine Drive, S.S. "Britannia," 206
Bearings, Arch Span, Sydney Harbour Bridge, Location and Erection, 559*
— Cylindrical, Distribution and Thickness of Oil Film, 416
— High Speed, Lasche's Experiments (Review), 33
— Locomotive Driving Axle, Floating-Bush Type, 473*. See 347*
— Metals. See *Alloys* under *Metallurgy*
— Michell Thrust, for Rotary Variable-Delivery Pump, 288*
— — Thrust, Temperature Limits, 295
— Railway Rolling Stock Axle Journals, Grinding Machine for, 637*
Bearsted Railway Accident, Report, 139
Beckinsale, S., on the Cracking of Lead Cable Sheathing, 299*, 334*. See 297
Bee-Hive Kilns for Refractory Materials, Firing with Oil Fuel, 33*
Belgian Congo, Proposed Water-Power Development, 685
Belgium, Economic Situation in, Report, 610
Bellingham & Stanley, Ltd., Binocular Refractometer, 102*
"Bellview," S.S., Stop-Valve Explosion 518
Belt Conveyors. See *Conveyors*
— Dressing Vat, Automatic Temperature Control, Crosby, 276*
Bending Experiments, H.M.S. "Wolf," Effective Moment of Inertia, 410
— Tests. See *Tests* (*Materials*)
Bengough, Dr. G. D., on Standard Corrosion Tests
Bennett, T. P., on Training of Architects, 263
Berlin, Klingenberg Electric Power Station, 58
Berliner Maschinenbau A.-G., Road Roller with Steam-Operated Scarifier, 284*; Oil-Engine-Driven Shunting Locomotive, 285*
Berry, A. F., on Domestic Electric Lighting and Heating, 724. See 704
Berry, Sir W. J., on Steel for Shipbuilding, 720. See 700
Berwick, Ferro-Concrete Road Bridge, 527*, 615*
Bessemer Medal, Iron and Steel Institute, Presentation to C. M. Schwab, 577
Bevan's Cement Works, Jetty, 445
Bevel Gears. See *Gears*
Beyer, Peacock & Co., Ltd., Grinding Machines for Locomotive Parts, 521*
Bhira Power Station, Tata Hydro-Electric Power Co., 747*, 771*, 819*
Bibby, J., & Sons, Ltd., Oil-Extraction Plant, Variable-Delivery Pressure Pump for, 288*
Bicycles. See *Cycles* and *Motor-Cycles*
Biles, Sir J., on Fuel for Ships, 378*, 430*. See 389
Bilge Water, Oily, Stream-Line Filter for, Japanese Navy, 150*
Billé Rubber Joint, Ferro-Concrete Water Pipes, 803*
Binary Alloys. See *Alloys* under *Metallurgy*
Binnie, W. J. E., on Floods and Waste Weir Capacity, 788*. See 760
Biological Exhibits, Royal Society Conversazione, 656
Biology, Collected Papers of Sir J. C. Bose (Review), 141
Biplanes. See *Aeronautics*
Bird, B. M., on Classification of Coal, by Hindered Settling, 818
Birmingham, British Industries Fair, 203*, 220*, 252*. See LETTER, 299
Birmingham and Midlands Motor Omnibus Company, Ltd., Use of Pneumatic Tyres, 18. See LETTER 351
— Saltley Sewage Works, Power Production from Sludge Gas, 162
Bismuth Alloys. See *Alloys* under *Metallurgy*
Bitumen-Laid Cable Explosion, Royal Institution, 80
Black, Carbon, Production from Natural Gas, 63
Blacksmiths' Shops. See *Smiths' Shops*
Blackwell, R. W., & Co., Ltd., Track Equipment, Post Office Railway, 158*, 216*
Blade Friction, Impulse Turbine Wheels, Formula for, 296
— Hack-Saw, Eclipse High-Speed Steel, 639
Blading, Turbine, Deposits from Boiler Compounds, 56*
— — Machining Operations, Metropolitan-Vickers Electrical Co., Ltd., 188*
Blair, Campbell & McLean, Ltd., Maclaurin Smokeless-Fuel Plant, Dalmarnock 128*
Blakeborough, J., & Sons, Ltd., Non-Jamming Full-Way Stop Valve, 41*
Blast Furnaces. See *Furnaces*
Blasting, Liquid Oxygen for, Chilean Mines, 818
Blocks, Concrete, for Building Construction. See *Concrete*
— Setting Crane. See *Crane*
Blowing-Off Device, Sediment, for Boilers, 256*
— Plant, Blast-Furnaces, Appleby Iron Co., Ltd., 551, 586
Board of Trade Committee, Simplified Practice in Manufacture, 324
— — Inquiries, Boiler Explosions, 352, 518
— — See also *Overseas Trade Department*
Boat, Flying. See *Seaplane* under *Aeronautics*
— Motor. See *Motor Boat*
— Ship's, Vreugdenhil Listproof Davits, 505*. See 541
— — Welin-Maclachlan Davits S.S. "Duchess of Bedford," 675*
— Submarine. See *Warships*
Boby, R., Ltd., Refrigerating Plant, British Industries Fair, 226*
Boby, W., & Co., Ltd., Domestic Water Softeners, 483
Bogies, Four-Wheel, Locomotive for Canadian National Railways, 473*. See 347*
— London Underground Railways, Repairs at Acton Works, 640*
— See also *Trucks*
Boiler Compounds, and Deposits on Turbine Blading, 56*
— Construction, Strength of Steel at High Temperatures, 702, 723. See 728
— Control, Automatic, Hagan System, 382
— Corrosion of, German Investigations, 777
— Explosions, Board of Trade Inquiries, 352, 518
— Express, Rapid Steam Raising, 303*
— Failures, Report on, 386
— Feed Pump. See *Pump*
— — Water Softening. See *Water Softening*
— — Water. See *Water*
— Flue Gases, Separating Dust from, Induced-Draught Fan for, 428*
— Furnace. See *Furnace* and *Stoker*
— Heating Feed Water by Waste Gases (Review), 472
— High-Pressure, Feed-Water Treatment with Sodium Phosphate, 55*
— — Pressure, Klingenberg Power Station, 59
— — Pressure, Lakeside Power Station, Milwaukee, Tube Failures, 25*, 55*
— Historical Exhibits, Institution of Civil Engineers' Conversazione, 709
— House Auxiliaries, Electric-Control Gear (Brookhirst Switchgear, Ltd.), 85*, 145*
— Locomotive, with Nicholson Thermic Syphons, 347*
— — Special Steels for, 695
— — Water-Tube Firebox, Experimental Results, 103
— — See also *Locomotive*
— Marine, Advantages of Air Pre-Heating, 323. See LETTER, 351
— — Comparisons of Coal and Oil Firing, 378*, 389, 430*
— — High-Pressure, S.S. "King George V," Results, 379. See 390; Tube Explosion, 352
— — Pulverised-Fuel Firing, Comparisons, 379, 430*. See 389
— — Use of High Pressures, 701, 721
Boiler, Marine, Use of Mechanical Stokers, Comparisons, 378, 430*. See 389
— — Water-Tube and Cylindrical, Comparisons, 378, 430*. See 389
— — Yarrow High-Pressure Water-Tube and Cylindrical, S.S. "Duchess of Bedford," 675*. See 711
— Plant Extensions, Shanghai Power Station, 685
— — Flue-Dust Collectors for (Davidson & Co., Ltd.), 222*
— — Govan Refuse Power Station, 549
— Practice, Factors of Safety in, 386
— — Present Trend in, 703, 723
— Pulverised-Fuel Firing, Electric Control Gear, 145*. See 85*
— — Fuel Firing in Power Stations, 742
— — Fuel Firing, Progress with, 323
— Scale, Heat Conductivity of, 777
— Sediment Blowing-Off Device, 256*
— Waste Heat, Use in Steel Works, Gas Works and Motor Ships, 233, 241*, 264, 272
— Water-Tube, Stirling, with Auxiliary Water-Screen Boilers, Pulverised-Fuel Fired, Trenton Channel Power Station, 499*, 532*
— See also *Engines and Boilers* in PARAGRAPH INDEX
Bolsover, R. H., Express Boiler and Superheater, 303*
Bolt Heads, Nuts and Washers, Standard Specification, 308
Bomb Calorimeter, Sodium-Peroxide, 623*
Bombay Electric Supply, Bhira Electric Power Station, 747*, 771*, 819*
Bongwan, Natal, Natural Carbonic-Acid Gas Compressing Plant, 46
Bonnington Power Station, Lanarkshire Hydro-Electric Power Co., Ltd., 767*, 791*
Books, New, Notes on, 10, 162, 193, 361, 456, 548, 666, 813. See LITERATURE INDEX
— Received, 14, 74, 166, 196, 258, 290, 320, 352, 414, 446, 478, 510, 540, 606, 638, 668, 772, 804
Booster Locomotive, Canadian National Railways, 347*, 473*
Boot and Shoe Industry, Technical Education in, 262
Boring Machine. See *Machine Tools*
Bose, Sir J. C., Collected Papers (Review), 141
Boston Navy Yard, Tests of Chain Links, 2*
— Port of, Arrangement and Equipment, 34*, 97*
Botany, Collected Papers of Sir J. C. Bose (Review), 141
Bottle Glass, Ultra-Violet Light Transmission through, 487
Bottomley, W. T., Theory of Silt and Scour, 307*
Box-Nailing Machine (W. Fredenhagen), 283*
Boynton, A. J., on Cleaning Blast-Furnace Gas, 819
Boys, C. V., Solid Dipleidoscope Prisms, 644
Brace, P. H., Study of Gases in Metals, 696
Bradfield, Dr. J. J. C., Sydney Harbour Bridge, Progress of Work, 467*, 559*. See *Erratum*, 540; Tests of Models of Structural Members, 697*
Bradford Coal-Breaking Machines, Trenton Channel Power Station, 434*
Bragg, Sir W., on Photo-Electricity, 201; on Faraday's Notebooks, 235; Crispations of Liquids, 644
Brake, Vacuum, for Motor Vehicles, 667*
— — Prestall Wrought-Steel Cylinder, 144
Brass, Behaviour During Hot Forging, 331*. See 313
— Cartridge Cases, Season Cracking, 304*, 312
— Corrosion of. See *Corrosion*
— Effect of Quenching and Tempering, 492*
— Foundry. See *Foundry*
— Ingots, Influence of Dissolved Gases, 313, 366*
Brazil, Aerial Survey of Rio de Janeiro, 486
Breakdowns. See *Accidents*
Breaking Machines, Bradford, for Coal, Trenton Channel Power Station, 434*
Breakwaters, Concrete Block, Bari Harbour, Italy, 245*. See *Addendum*, 382
— Construction, Takoradi Harbour, 455*
— Harbour, Comparisons of Types, 725, 749
Breeze, Coke, as Concrete Aggregate, Investigations, 120
Breweries, Cask-Washing Machine for, 195*
Brickmaking, Clay Proportioning, Mixing and Feeding Machine for, 510
— Elevating Pugmill for Clay, 509*
Bricks, Fire. See *Refractory Materials*
— Road-Paving, Tests of, 96
— Transporting by Wheel Barrow, Fatigue Investigations, 817
Bridges, Arch, Optical Determination of Stresses, 810*. See 709
— Building, Treatise on (Review), 83
— Cantilever, Carquinez Strait, California, Construction and Erection, 5*
— Charing Cross, Ministry of Transport Proposals, 513, 609. See LETTER, 738
— Construction and Road Traffic Requirements, 726, 750
— Design, Secondary Stresses in, 201. See *Erratum*, 290
— Earthquake Effect on, Hydraulic Damping Gear for, 5
— Eyebars, Tensile Tests, 5
— Ferro-Concrete Arch, River Tweed, Berwick, 527*, 615*
— Railway, Advantages of Ferro-Concrete, 700, 719
— — and Vehicular, Vancouver Harbour, 151
— Schering, for Testing Insulating Materials, Cambridge Direct-Reading Type, 50*
— Steel Arch, Newcastle-on-Tyne, Erection of, 266*
— — Arch. See also *Bridge, Sydney Harbour*
— Suspension, Delaware River, Philadelphia, Design of, 1
— — over Detroit River, 357
— — Stresses in Stiffening Girders, 1
— Sydney Harbour, Construction of Approach Spans and Abutment Towers, 467.* See *Erratum* 540; Location and Erection of Main Bearings, 559*; Tests of Model Members for, 697*
Bridges, Thames, London, Report of Royal Commission, 20
— See also PARAGRAPH INDEX
Brighton, Automatic Substations at, 649*
Brinell Tests. See *Hardness* under *Tests* (*Materials*)
Bristol, Port of, Extension of Royal Edward Dock, Avonmouth, 565*, 591*. See 644
"Britannia" S.S., Bauer-Wach Exhaust Turbine Drive, 206
British Acetylene and Welding Association. See *Acetylene*
— Association, Grant of Royal Charter to, 483
— Brown-Boveri, Ltd., Electric Locomotive, Great Indian Peninsula Railway, 297*
— Corporation Register of Shipping and Aircraft Work 357; Rules and Tables, 738
— Drying and Heating Co., Ltd., Poumay System Foundry Cupola, 744*
— Electrical and Allied Manufacturers' Association, Circular on Foreign Plant in British Power Stations, 172
— Electrical Development Association, Work of, 388, 739
— Engineering Standards Association. See *Engineering Standards*
— Engineers' Association, Discussion on Rating Proposals, 775
— Industries Fair, Birmingham, 203*, 220*, 252*. See LETTER, 299
— Motor and Allied Manufacturers' Association, Research on Viscosity of Oils, 628
— Navy. See *H.M.* under *Warships*
— Non-Ferrous Metals Research Association, Report, 685
— Pig Iron Industry, Position of, 674
— Railways. See *Railways*
— Shipbuilding. See *Shipbuilding*
— Shipping. See *Shipping*
— Thomson-Houston Co., Ltd., 5,000-kw. Frequency Changer, Stourport Power Station, 144; Exhibits at British Industries Fair, 205*
— Trade. See *Trade*
Brittleness in Chain Links, Effects of Proofing and Annealing, 2*
— in Wrought-Iron Chains and Cables, Causes, 515, 618*, 652*, 741
Brodie, J. A., on Liverpool's Road Traffic Requirements, 635
Broken Stone, Gauges of, Standard Specification, 666
Bronze, Effect of Quenching and Tempering, 492*
— Thermal and Electrical Conductivity, 301*. See 312
Brookhirst Switchgear, Ltd., Electric Control Gear, Boiler-House Auxiliaries, 85*, 145*
Brown, Boveri & Co., Ltd., Electric Locomotive, Great Indian Peninsula Railway, 297*
Brown-Boveri Individual-Axle Drive, Electric Locomotives, 298*
Brown Bros. & Co., Ltd., Steering Gear, S.S. "Duchess of Bedford," 676*
Brown, C. J., on Materials in Railway Engineering, 719. See 700. See *Erratum*, 739
Brown-Firth Research Laboratories, Tests of Heat-Resisting Steels, 589, 601, 622, 632
Brown Hoisting Machinery Co., Coal-Handling Plant, Trenton Channel Power Station, 369*
Brown, J., & Co., Ltd., S.S. "Duchess of Bedford," 676*. See 711
Brownlie, D., on Production of Liquid Fuel from Coal, 671. See LETTER, 738
Bubbles, Gas, Production in Liquids by Submerged Orifices, 30
Bubble Manometer for Precision Measurements (Negretti & Zambra), 102*
Bucket Conveyor. See *Conveyor*
Buckham, Sir G., the Late, 612*
Buell Pulverised-Fuel Burner, 432*
Building Construction, Concrete Blocks for. See *Concrete*
— — See also *Ferro-Concrete* and PARAGRAPH INDEX
— Development, London County Council, 48
— Heating, Low-Temperature Radiating Panels, 139, 791
— — and Ventilating System, Trenton Channel Power Station, 795*
— Materials, Alternating-Stress Tests, 239
— — Sound Transmission through, 368
— — Weathering of, 239
— Research Board, Investigations of By Product Aggregates and Pozzuolanas, 120; Annual Report, 238
— Steel-Framed, Corrosion and Life of, 433
— — Framed, Wind Stresses in, 625*
— Trades Exhibition, 474*, 508*
Bulging of Tubes, High-Pressure Boilers, Lakeside Power Station, 25*, 55*
Bull, H., on Autogenous Welding of Stainless Steel, 478
Bunker, Coal, Ferro-Concrete, Stourport Power Station, 11*
Bureau of Mines. See *United States*
— of Standards. See *United States*
Burmeister & Wain Oil Engines, Motor Train Ferry "Korsör," 42*
Burners, Gas, Surface Combustion, Cox's Ignite Combustors, 221*
— Oil-Fuel. See *Oil Fuel*
— Pulverised-Fuel. See *Pulverised Fuel*
Burr, J. W., on Administration of Electricity Supply Undertakings, 737
Burtner, Prof. E., on Car-Float Strength and Deflection, 54
Business Premises and the Landlord and Tenant Act, 451
Busk Studentship in Aeronautics, 487
Bussing, H., Automobilwerk, Motor Omnibus, 327*
Buxton Colliery Research Station, Work of, 28; Investigations of Coal-Mining Explosives, 715
Buxton Lime Firms Co., Ltd., Petrol Shunting Locomotive, 8*

C.

CABLES and Chains, Wrought-Iron, Causes of Failure, 515, 618*, 652*, 741. See 2*
— Laying Machine, Weserhütte, 681*
— See also *Wire Ropes* and *Electric*
Caerphilly Urban District Council *versus* Griffin, Private Supply of Electricity, 19
California, Carquinez Strait Bridge, Construction and Erection, 5*
— Los Angeles, Failure of St. Francis Dam, 419*, 452*, 547, 580, 644
— Sacramento Northern Railroad, Electric Locomotives for, 664
— San Francisco Bay, Destruction of Timber Piling by Marine Boring Organisms, 757*
Callender's Cable and Construction Co., Ltd., Automatic Plumber for Jointing Lead-Sheathed Cables, 254*
Calorimeter, Bomb, Sodium-Peroxide, 623*
Cambridge Instrument Co., Ltd., Exhibits at Physical and Optical Societies' Exhibition, 49*; Hydraulic Traction Dynamometer for Ploughing, 538*; Exhibits at Royal Society Conversazione, 655*
Cammell Laird & Co., Ltd., M.S. "Greystoke Castle," 380*
Campbell, J. R., on Washing Coal, 818
Camshaft Control Gear, Electric Trains, 155*. See 214*
— Drives, Diesel Engines, Wear and Efficiency of Skew Gears, 427*
Canada, British Trade with, Development of, 482. See 230, 612
— Engineering Institute of, Electrically-Heated Trash Screens at Shawinigan Falls Power Plant, by C. R. Reid, 514
— National Exhibition and Steel and Power Show, Toronto, British Participation, 482, 612
— Niagara Falls, Preservation Proposals, 418*
— Port of Quebec, 183*
— River St. Lawrence and Great Lakes Improvements, 62*, 114*, 125*, 137
— Road Construction in, 419
— Shawinigan Falls Power Plant, Electrically-Heated Trash Screens, 514
— Siliceous Abrasives in, Report, 519. See 29
— Water Power, Public and Private Ownership, Comparisons, 642
Canadian Department of Mines, Investigations on Abrasive Materials, 29. See 519
— Engineering Standards Association, Electrical Code, and British Electrical Fittings, 230
Canadian Locomotive Co., Ltd., Locomotive for Canadian National Railways, 347*, 473*
— Market for British Electrical Fittings, 230
— National Railways, 4-8-4 Type Locomotive for, 347*, 473*
— Pacific Railway Co., S.S. "Duchess of Bedford," 675*. See 711; Pier at Vancouver, Piling Operations, 202
— Standard Screw Threads and British Electrical Fittings, 230
Canals, Irrigation, Theory of Silt and Scour, 307*
— Manchester Ship, Traffic Statistics, 429
— Navigation, River St. Lawrence and Great Lakes Improvement, 62*, 114*, 125*, 137
— Panama, Annual Report, 80; Statistics, 276, 443
— and Railways, Early Competition, 710
— Upper Jhelum, Drainage Syphons, 20
— See also PARAGRAPH INDEX
Cantilever-Beam Test, Strength of Concrete, 495
— Bridge. See *Bridge*
Cantor Lectures on Fatigue Phenomena, 200, 232, 264
Capacity. See *Electric*
Capital and Labour. See *Labour*
Capstan Lathe. See *Lathe* under *Machine Tools*
Carbon Bisulphide, Conveyance by Road, Proposed Regulations, 669
— Black, Production from Natural Gas, 63
— Dioxide Fire-Extinguishing Installation, Lux System, Barking Power Station, 441*
— Monoxide in Mines, Estimation by Iodine Pentoxide, 507
Carbonic-Acid Gas, Natural, Compressing Plant, Bongwan, Natal, 46
Carbonisation, Coal, Gas Manufacture, Effects of Temperature, Size of Coal, and Blending, 769
Carburisation. See *Heat Treatment* under *Metallurgy*
Cardiff Meeting, Institution of Gas Engineers. See *Gas Engineers*
Cargo-Handling Appliances, Port of Boston, 35*. See 97*: Port of Quebec, 183
— — Appliances, Southampton Docks, 802. See 809
— Steamers. See *Steamers*
Carnegie Scholarship Memoir on Strain in Steel, 79
Carquinez Strait Bridge, Construction and Erection, 5*
Carr, J. L., on Domestic Electrification, 738
Carriage of Goods by Passenger Train, Charges for, 645
— — by Rail, Legal Position, 503
— Overhaul Works, Acton, London Underground Railways, 645*
Carrington, Dr. H., on the Deflections of Flat Plates, 31*. See *Erratum*, 83
Cars, Motor. See *Motor Cars*
Cartridge Cases, Season Cracking of, 304*, 312
Case Hardening. See *Heat Treatment* under *Metallurgy*
Cask-Washing Machine (Mather & Platt, Ltd.,) 195*
Cast Irons, Corrosion-Resisting, Compositions of, 338
— — Fatigue Tests of, 14, 142
— — Influence of Nickel, 579
— — Steam Pipe, Explosion at Colliery, 518
Castings, Chilled, Production and Economics, 778
— Grey Iron, Standard Specification, 480
Castings, Heavy, Production at Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 66*
— Malleable-Iron, Standard Specifications, 276
Castor Oil, Viscosity at High Pressures, 281
Catalogues, 30, 119, 182, 306, 368, 399, 464, 588, 623, 654, 756. See PARAGRAPH INDEX
Catchment Areas, Rate of Discharge from, 760, 788*
Catenary System, Overhead-Line Construction, South African Railways, 652*
Caterpillar Track, Hand Barrow with, 224*
Cavitation with Screw Propellers, 439
Ceag, Ltd., Inspection Lamp for Barrels, &c., 253*
Cells. See *Electric*
Celluloid Models, Stress Determination by. See *Optical*
Cement and Concrete for Engineering Structures, Recent Developments, 699, 719
— Investigations of Building Research Board, 239
— Manufacture, Utilisation of Waste Heat, 497, 562
— Mortars and Concrete, American Research Work, 495
— — and Concretes, Proportioning and Mixing (Review), 286
— — Investigations of Cracking, 495
— Pozzuolanas, Building Research Board Investigations, 120
— Rapid-Hardening, Ciment Fondu and Ferro-crete, Properties and Uses, 699, 719
— Works, Northfleet, Deep-Water Jetty, 445
— See also *Concrete* and PARAGRAPH INDEX
Cementation. See *Heat Treatment* under *Metallurgy*
Centenary Celebrations, Institution of Civil Engineers. See *Civil Engineers*
Central Electricity Board, South-East England Electricity Scheme, 230
— England Electricity Scheme, 454*
— Station. See *Power Station*
Centreless Grinding Machines (Herminghausen-Werke), 326
Centrifugal Pumps. See *Pumps*
Centring, Timber, Ferro-Concrete Arch, Royal Tweed Bridge, Berwick, 527*
Ceramic Society, Practical Experience of Firing Refractory Materials with Oil, by F. West, 336*
Ceylon, Colombo Gas Works, 771
Chain Belt Company, Circulating Water Screens, Trenton Channel Power Station, 690*
— and Cables, Wrought Iron, Causes of Failure, 515, 618*, 652*, 741. See 2*
— Links, Brittleness in, Effects of Proofing and Annealing, 2*
— Track Tractor. See *Tractor*
— Wheels, P.I.V. Variable-Speed Gear, Milling, 256*
Chalmers, A. G. N., on Mining Methods at the Morro Velho Mine, 379
Chalmers, G., the Late, 175
Chamber of Shipping, Annual Report, 263
Champlain, Lake, Early Steamboats on, 549
Champness, E. L., on the Relative Strength of Cargo Vessels, 408
Change-Speed Gear. See *Gear; Motor-Car Details*
Channels, Open, Variable Flow in, 688*
— Water Flow in, Theory of Silt and Scour, 307*
Charing Cross Bridge, Ministry of Transport Proposals, 513, 609. See LETTER, 738
— — Station, Southern Railway, Proposed Removal, 513, 609. See 738
Charter Centenary Celebrations, Institution of Civil Engineers. See *Civil Engineers*
Charts, Alignment, Flow of Viscous Liquids through Pipes, 498*
Chemical Analysis. See *Analysis*
— Engineers and the Fuel Industries, 611
— — Institution of, Memorandum on Training, 52; Conference with Society of Chemical Industry. See *Chemical Industry, Society of*
— Heavy, Manufacture, Recent Developments, 643. See *Erratum*, 665
— Industry, Society of (Chemical Engineering Group), Conference with Institution of Chemical Engineers: Fuel Industries and the Work of the Chemical Engineer, by Sir A. Duckham, 611; Chemical Study of Low-Temperature Tar, by Prof. G. T. Morgan, 611; Water Purification, by Sir A. Houston, 611; Pollution of Tidal and Non-Tidal Rivers, by J. H. Coste, 611; Scientific Research as Applied to Industry, by Sir A. Mond, 643; Part Played by British Workers in the Application of Fixed Nitrogen to the Soil, by Sir J. Russell, 643; Developments in the Heavy-Chemical Industry, by Lieut.-Col. C. P. Pollitt, 643. See *Erratum*, 665
— Investigations, Low-Temperature Tar, 611
— Properties of Crystals, 613
— Research Laboratory, Teddington, Investigations of Low-Temperature Tar, 611
Chemistry, Analysis of Opal Glass, 487
— of Corrosion. See *Corrosion*
— in Gas Making, 799
— Higher Coal-Tar Hydrocarbons (Review), 372
— Institute of, Jubilee Celebrations, 52
— Phosgene, Properties of, 668
— Transformation of Matter, 315*, 360*, 387*, 422*
— See also PARAGRAPH INDEX
Chicago Drainage and the Great Lakes, 126*. See 62*, 114*, 137
— — Pollution and Self-Purification of River Illinois, 544
— 132,000-volt Oil-Filled Cable Installation, 177*
Chile, Industrial and Economic Situation, Report, 548
Chilean Mines, Liquid Oxygen for Blasting, 818
— Navy, Torpedo-Boat Destroyers for, 111. See 638
Chilled Castings, Production and Economics, 778
Chimneys, Boiler, Dust Collectors for (Davidson & Co., Ltd.), 222*
China, Machinery Imports, 174
— Shallow-Draught Gunboats for the Yangste-Kiang, 333*
— Shanghai Electric Power Station, Extensions, 685. See 805
Chirnside, R. C., on Analysis of Opal Glass, 487
Chlorination, Water for Domestic Purposes, 760, 787
Chromium Ore, World Supplies of, 440
— Plating, Investigations on, 550
— Steel Rails and Fishplates, Behaviour in Service, 602, 617, 632
Churchill Shaft Grinding Machine, Metropolitan-Vickers Electrical Co., Ltd., 731*
Chutes, Spiral, for Mails, Post Office Tube Railway, 312*
Ciment Fondu, Properties and Uses, 699, 719
Cinematograph. See *Kinematograph*
Circuit Breakers. See *Switchgear*
Circular Saws. See *Saws* under *Machine Tools*
Circulating Device, Locomotive Boilers, Nicholson Thermic Syphon, 347*
— Pumps. See *Pumps*
— Water, Supply of, Legal Position, 170
— — System, Trenton Channel Power Station, 690*
Citroën Differential-Stroke Petrol Engine, Kinematics of, 277*
"City of Roubaix," Ellerman Liner, 175
Civil Aerial Transport. See *Aeronautics*
— Engineering, Standard Construction Methods (Review), 780
— Engineers, American Society of, Hydrostatic Uplift in Pervious Soils, by H. de B. Parsons, 514

Civil Engineers, Institution of:
Standards of Thermal Efficiency for Internal-Combustion Motors, by Sir D. Clerk, 10
Railway and Vehicular Bridge, Vancouver Harbour, by A. D. Swan, 151
Power Gas from Sewage Sludge, by F. C. Vokes and C. B. Townend, 162
Reinforced-Concrete Piles in Gravel Fill at Vancouver, B.C., by R. M. Wynne-Edwards, 202
Earth Pressures on Flexible Walls, by R. N. Stroyer, 303
Jetty and Pump-House Works at Barking Power Station, by J. Williamson, 319
Methods at the Morro Velho Mine of the St. John del Rey Mining Co., Ltd., by A. G. N. Chalmers, 379
Distribution and Thickness of the Oil Film in a Flooded Cylindrical Bearing, by J. Goodman, 416
Deep-Water Jetty at Bevan's Cement Works, Northfleet, by Dr. O. Faber and C. P. Taylor, 445

Civil Engineers, Institution of, Charter Centenary Celebrations and Conference:
Preliminary Announcement, 357
Programme, 645
Inaugural Proceedings, 699
Presidential Address, by E. F. C. Trench, on the History and Prospects of the Institution, 707. See 699
Reception of Delegates and Presentation of Addresses, 699
James Forrest Lecture on a Century of Inventions, by Sir J. A. Ewing, 709, 755. See 707
Conversazione and Historical Exhibition, 708
Reprints of Abstracts, 719, 749, 785
Reports of Discussions, 699, 725, 759
Banquet to Delegates, 761
Recent Developments in Concrete and Cement for Engineering Structures, by F. E. Wentworth-Shields, 719. See 699
Developments in the Use of Materials in Railway Engineering, by C. J. Brown, 719. See 700. See *Erratum*, 739
Railway Design and Maintenance as Affected by the Application of Electricity, by G. Ellson and A. R. Cooper, 720. See 700, 814
Steel for Shipbuilding, by Sir W. J. Berry, 720. See 700
Generation and Utilisation of High-Pressure Steam for Marine Propulsion, by Lord Weir and H. E. Yarrow, 721. See 701
Progress in the Adoption of the Internal-Combustion Engine for Marine Purposes, by Prof. C. J. Hawkes, 721. See 701
Utilisation of Solid and Liquid Fuels, by Dr. C. H. Lander, 722. See 701
Coke-Oven, Town and Producer Gas, by R. Ray, 722. See 702
Waterless Gasholders, by F. Prentice, 722. See 702
Properties of Materials for Use at High Temperatures, with Special Reference to Boilers for Superheated Steam, by R. G. C. Batson, 723. See 702
Present Trend in Boiler Practice, by W. H. Patchell, 723. See 703
Electric Transmission of Power as Applied to Large Areas, by A. Page, 724. See 704
Domestic Lighting and Heating, and its Influence on Load Factor of Supply, by A. F. Berry, 724. See 704
Dimensions of Harbour and Dock Approaches, by Sir C. R. S. Kirkpatrick, 749*. See 725
Harbour Breakwaters, by H. H. G. Mitchell, 749. See 725
Modern Road and Bridge Construction, by F. C. Cook, 750. See 726
Problem of Road Traffic from the Engineering Point of View, by H. R. Hepworth, 750. See 726

Civil Engineers, Institution of, Charter Centenary Celebrations and Conference —*continued.*
Latest Types of Steam and Internal-Combustion Locomotives, by Sir H. Fowler and H. N. Gresley, 751. See 726
Light High-Speed Internal-Combustion Engines, by H. R. Ricardo, 751. See 727
Heavy Internal-Combustion Engines, by G. Porter, 752. See 727
General Trend of Modern Development in Steam-Turbine Practice, by H. L. Guy, 752. See 727
Prospective Development in the Generation of Electricity, and its Influence on the Design of Station Plant, by Dr. S. L. Pearce, 753*. See 728
Tidal Power and Turbines for its Utilisation, by Prof. A. H. Gibson, 785. See 759
Progress in Hydro-Electric Installations, Including Intakes, Leats, Tunnels, Dams, Headraces, Pipe Lines and Tailraces, by J. McLellan, 786. See 759
Problems Involved in Mining at Great Depths, by J. Whitehouse, 787. See 759
Metallurgy of Complex Lead-Zinc-Copper Ores, by S. Field, 787. See 759
Filtration and Treatment of Water for Domestic Purposes, by Sir A. C. Houston and H. E. Stilgoe, 787*. See 760
Floods, with Special Reference to Waste-Weir Capacity, by W. J. E. Binnie and Dr. H. Lapworth, 788*. See 760
Advantages of Different Types of Sewage Tanks, by W. Clifford, 789. See 760
Sewerage, with Special Reference to Run-Off, by J. B. L. Meek, 789*. See 760
Civil Servants, Professional, Institution of, See *Professional Civil Servants*
— Service Engineers, Status of, 484
Clark, W. S., on 132,000-volt Cables, 177*
Clarke-Chapman Short-Flame Pulverised-Fuel Burner, 432*
Classification of Shipping and Aircraft, Work of British Corporation, 357
Clay, Dr. R. S., on the Stereoscope, 494
— Elevating, Pugmill for, 509*
— Fire. See *Refractory Materials*
— Proportioning, Mixing and Feeding Machine for Brickmaking, 510
Clerk, Sir D., on Standards of Thermal Efficiency for Internal-Combustion Motors, 10
Cleveland Iron Prices. See *Metal-Price Diagrams*
— and the Northern Counties, Notes from, 14, 44, 75, 105, 135, 166, 196, 235, 258, 290, 320, 353, 382, 414, 446, 479, 511, 540, 572, 606, 638, 668, 705, 739, 772, 804. See PARAGRAPH INDEX
Clifford, W., Comparisons of Sewage Tanks, 789. See 760
Clinker as Concrete Aggregate, Investigations, 120
Clip, Hose, Quick-Fastening Type, the "No Screw," 29*
Clock Winding, Venner Motor for, 102
Cloth, Varnished, Electrical Insulation, Microscopic Examination, 621*
Cloud Forms, Alpine, 540
Clyde Falls, Bonnington and Stonebyres Power Stations, 767*, 791*
CO_2. See *Carbon Dioxide*
Coaches, Railway. See *Carriages*
Coal-Breaking Machines, Bradford, Trenton Channel Power Station, 434*
— British Exports, Effect of Strike, 452. See 450
— Bunker, Ferro-Concrete, Stourport Power Station, 11*
— Bunkering Arrangements, Boston, 99
— By-Products, Use for Electric Power Production, 742
— Carbonisation, Gas Manufacture, Effects of Temperature, Size of Coal, and Blending, 769
— Consumption, Electric Power Stations, Statistics, 450, 799
— Dryers, Pulverised-Fuel Plant, Trenton Channel Power Station, 435*
— Dust Explosions, Work of Safety in Mines Research Board, 28
— Fuel for Ship Propulsion, Comparisons with Oil, 378,* 389, 430*
— Gas. See *Gas*
— Handling Plant. Klingenberg Power Station, 58
— — Plant, Stourport Power Station, 11*
— — Plant, Trenton Channel Power Station, 344*, 369*
— Liquid Fuel Production from, 671. See LETTER, 738
— Low-Temperature Carbonisation, Chemical Investigations of Tar, 611
— — Temperature Carbonisation, Dvorkovitz Process, 72*
— — Temperature Carbonisation and Effective Utilisation of, 701, 722
— — Temperature Carbonisation, Maclaurin Plant, Dalmarnock, 128*
— — Temperature Carbonisation Processes, Development of, 671. See LETTER, 738
— — Temperature Carbonisation, Treatise on (Review), 517
— Methods of Utilising, 701, 722
— Mine. See *Colliery*
— Mining Explosives, Investigations at Buxton Experimental Station, 715
— and Mining Industries, Operating Problems, 778
— Oils from, Comparisons with Oils from Shale, 9
— Pulverised. See *Pulverised Coal*
— Pulverising Mills, Raymond, Trenton Channel Power Station, 435*

Coal, Resources, National, Physical and Chemical Survey of, Report on Wigan Seam, Lancashire Coalfield, 414
— Strike, Effects of, 450, 452
— Hydrocarbons, the Higher (Review), 372
— Tests of Washability, 818. See 414.
— Unloading Machine, Trenton Channel Power Station, 369*
— Washing Tables, Classification of Feed, 818
— Wigan Seam, Washing Tests, 414
— — Seam, Lancashire Coalfield, Report, 414
— Working of (Review), 346
— See also PARAGRAPH INDEX
Coalfield, Lancashire, Wigan Seam, Report, 414
Coast Lighting, Exhibits, Institution of Civil Engineers' Conversazione, 708
Cobham, Sir A., Seaplane Flight Round Africa, 740
Coffman, A. W., on Surface Tension of Solders, 212
Coils, Armature, Manufacture, Metropolitan-Vickers Electrical Co., Ltd., 405*, 731*
Coke Breeze as Concrete Aggregate, Investigations, 120
— Oven Plant, Silica, Consett Iron Co., 165
— — Use of Gas and Waste Heat, 241*, 272, 700, 722, 742
— Reactivity of, Investigations, 276, 578, 800
Coker, Prof., E. G., on Stresses in Stranded Vessels, 427*. See 499; Investigations of Stresses in Arch Bridges, 810*. See 709
Coking, Low Temperature, of Coal. See *Coal*
— Stoker. See *Stoker*
Cold Saw. See *Machine Tools*
— Stores, Southampton Docks, 802
— — See also *Refrigeration*
— Worked Soft Metals and Eutectics, Hardness of, 313
— Working of Metals, Density Changes, 313
Colenso Power Station, South African Railway Electrification, 651. See 402
College. See *Education*
Collet & Engelhard, Horizontal Boring and Milling Machine, 283*
Collieries, Carbon Monoxide in, Estimation by Iodine Pentoxide, 507
— Explosives for, Investigations at Buxton Experimental Station, 715
— Safety in Mines Research Board, Report on Wire Ropes, 28, 643. See LETTER, 645; Report on Work, 28; Buxton Experimental Station, Investigations of Coal-Mining Explosives, 715; Reports on Pressure Produced by Blowing Fuses and by Arcing in Closed Vessels, 715
— Sampling Atmospheric Dust in, Impinger-Plate Method, 290
— Wire Ropes for, Federation of Manufacturers, 645
— Working of Coal (Review), 346
Colliery Explosions, Firedamp, Work of Safety in Mines Research Board, 28
— Materials, Standard Specification, 579
— Research Station, Buxton, Work of, 28, 715
— Shaft Sinking, Treatise on (Review), 528
— Winding. See *Winding*
— See also *Mines* and *Coal*
Collisions. See *Accidents*
Colombo Gas Works, 771
Colonial Institute, Royal, The Organisation of Research, by H. T. Tizard, 385
Colour-Photography Process (Colour Photographs, Ltd.), 779
Coloured Glass, Casing of Colourless Glass, 616
Columns, Ferro-Concrete, Effect of Concrete Shrinkage on Stress Distribution, 515
Combined Stress. See under *Tests (Materials)*
Combustion Engineering Corporation, Pulverised-Coal Plant, Trenton Channel Power Station, 435*
— Surface, See *Surface Combustion*
Commerce. See *Trade*. See also *Industries and Trade* in PARAGRAPH INDEX
Commercial Aviation. See *Aeronautics*
— Motor Cars. See *Motor*
— Motor Users' Association, Annual Luncheon, 383
Commission, Royal. See *Royal Commission*
Committee, Board of Trade, Simplified Practice in Manufacture, 324
— Engineering Standards. See *Engineering and Standardisation*
— on Industry and Trade, Reports, 449, 576
Commonwealth. See *Australia*
Commutator Manufacture, Metropolitan-Vickers Electrical Co., Ltd., 732*
Companies. See PARAGRAPH INDEX
Compound Locomotives. See *Locomotives*
— Stress. See *Tests (Materials)*
Compressed-Air Hose, Quick-Fastening Clip for, 29*
— — Increasing Oil-Well Yield by, 818
— — Sinking Ferro-Concrete Piles by, 510
— — Tools. See *Machine Tools*
— — See also *Pneumatic*
Compressing Plant, Natural Carbonic-Acid Gas, Bongwan, Natal, 46
Compressor, Air. See *Air Compressor*
— Ammonia (Pulsometer Engineering Co., Ltd.), 223*
— Sulphur Dioxide and Ammonia (R. Boby, Ltd.), 226*
Conciliation in Labour Disputes. See *Labour* and PARAGRAPH INDEX
Concrete, Adhesion to Steel in Reinforced Concrete, 239
— Blocks, Floating Crane for, Bari Harbour, Italy, 247*
— — Plant, Harbour Construction, Bari, Italy, 245*. See *Addendum*, 382
— Breaking, Pneumatic Hammers for, 222*
— Building Blocks, Methods of Tamping, 495
— and Cement for Engineering Structures, Recent Developments, 669, 719
— Effect of Aggregate on Strength, 79, 699, 719
— — of Time and Aggregate, American Investigations, 79
— Extensometer for Determination of Young's Modulus, 131*
— Factors Affecting Quality, 495
— Floors for Heavy Duty, 495
Concrete, Flow under Compressive Stress, 495
— Institute, American, Reports on Concrete Investigations, 79; Investigations of Coarse Aggregates, by Prof. H. J. Gilkey, 79; Report on Control of Concrete in the Field, 121; Concrete Primer, by F. R. McMillan, 495; Report on Research Work, by H. F. Gonnerman, 495; Aggregates, by R. W. Crum, 495; Measurement of Workability of Concrete, by G. A. Smith and G. Conahey, 495; Flow of Concrete under Sustained Compressive Stress, by Prof. R. E. Davis, 495; Crazing of Portland Cement Mortars, by P. H. Bates and C. H. Jumper, 495; Effect of Tamping on Concrete Building Units, by C. L. Bourne, 495; Heavy-Duty Concrete Floors, by C. E. Covell, 495; Carrying Capacity of Semi-Circular Hooks, by Prof. T. D. Myirea, 495; Testing Concrete in the Field, by C. A. Wiepking, 495; Reinforced-Concrete Columns, by P. I. Markmann, 515
— Investigations of Building Research Board, 239
— — of Coarse Aggregates, 79
— — of Cracking, 495
— Light, Aerocrete, 700
— Mixer, Improved Chain-Spade Type (Winget (1924), Ltd.), 475*
— — Open-Drum Type (Goodwin, Barsby & Co., Ltd.), 475*
— — Roadmaker, Turntable Mounting (Winget (1924), Ltd., 475*
— — Rotary-Cube Type (A. C. E. Machinery, Ltd.), 509*
— Mixing Plant, Harbour Construction Works, Bari, Italy, 246*. See *Addendum*, 382
— — Importance of Cement-Water Ratio, 121
— — Machines, Leipzig Fair, 285*
— — and Proportioning, Field Control of, 121
— and Mortars, Cement, American Research Work, 495
— Pozzuolana, Harbour-Construction Works, Bari, Italy, 245*. See *Addendum*, 382
— Proportioning and Mixing (Review), 286
— Reinforced. See *Ferro-Concrete*
— Retaining Walls, Expansion Joint for, 468*
— Shrinkage, Effect on Stress Distribution, Ferro-Concrete Columns, 515
— Skewbacks, Sydney Harbour Bridge, 470*. See 559
— Slag, Breeze and Clinker as Aggregates, Investigations, 120
— Strength of, Cantilever Beam Test, 495. See 121
— Transverse Tests for, 121. See 495
— Water Conduits, Chemical Action of Water on, 111. See *Erratum*, 202
— Workability of, Methods of Measuring, 495
— See also *Ferro-Concrete* and PARAGRAPH INDEX
Condensers, Air Pumps for. See *Pumps, Air*
— with Central Air Extraction, Metropolitan-Vickers Electrical Co., Ltd., 658*
— Leakage and Tube Failures, High-Pressure Boilers, Lakeside Power Station, 25*, 55*
— Tube Plates, Drilling Machine for, Metropolitan-Vickers Electrical Co., Ltd., 657*
— See also *Electric*
Condensing Plant, Manufacture. See *Metropolitan-Vickers Electrical Co., Ltd.*
— — Trenton Channel Power Station, 660*, 690*
— — Turbine Test Beds, Metropolitan-Vickers Electrical Co., Ltd., 762*
— — Two-Stage Air Ejectors, Metropolitan-Vickers Electrical Co., Ltd., 659*
— Water, Legal Position Regarding Supplies, 170
Conductivity, Thermal and Electrical, Aluminium Alloys and Bronzes, 301*. See 312
— See also *Electric*
Conduits, Circulating Water, Trenton Channel Power Station, 690*
— Water, Concrete, Chemical Action of Water on, 111. See *Erratum*, 202
— — Power Plants, Progress in Design, 786. See 759
Conference, Charter Centenary Celebrations, Institution of Civil Engineers. See *Civil Engineers*
— Society of Chemical Industry and Institution of Chemical Engineers. See *Chemical Industry, Society of*
— Verein Deutscher Eisengiessereien, 811
Congo River, Proposed Water Power Development, 685
Congress, Liverpool, Institute of Transport. See *Transport, Institute of*
Consett Iron Co., Silica Coke-Oven Plant, 165
Constants, Galvanometers and Fluxmeters, Graphical Determination, 338
Construction Methods, Standard (Review), 780
Constructional Engineering Industry, Position and Prospects, 388
Consulting Engineers, Association of, Annual Dinner, 111
— Marine Engineers and Ship Surveyors, Society of, Air-Preheating for Marine Boilers, by A. Macfarlane, 323. See LETTER, 351
Control Gear, Automatic, Hydraulic Turbines, 793*
— — Electric, Boiler House Auxiliaries (Brookhirst Switchgear, Ltd.), 85*, 145*
Controllers, Electric Motor. See *Motors, Electric*
Conversazione, Institution of Civil Engineers Charter Centenary Celebrations, 708
— Royal Society, Exhibition of Scientific Instruments and Apparatus, 643, 655*, 779
Conveyors, Band, Coal-Handling Plant, Stourport Power Station, 11*
— — Grain-Handling, Avonmouth Docks, 591*, 593*
— — for Wool, Southampton Docks, 802
— and Elevators, Mail Bags, Post Office Tube Railway, 309*
— Motors, Starting and Control Gear, 85*. See 145*
— Screw, on Refuse-Collecting Cart, 556*
Conveyors, Work, Acton Overhaul Works, London Underground Railways, 645*
Cook, F. C. on Road and Bridge Construction, 750. See 726
Cooke, Troughton & Simms, Ltd., Internal-Focussing Anallatic Tacheometer, 350*
Cooking and Heating Apparatus, Electric, British Industries Fair, 252
Coolers, Air, for Turbo-Generators, Trenton Channel Power Station, 606*
Cooling Curves, Alloys. See *Metallurgy*
— Water, Internal-Combustion Engines, Automatic Temperature Control, Crosby, 276*
— — Supply of, Legal Position, 170
— — System, Trenton Channel Power Station, 690*
Co-Operation. See *Labour*
Cooper, A. R., on Effect of Electrification on Railway Design and Maintenance, 720. See 700, 814
Cooper, Colonel H. L., on Government Control of Water Power in United States, 642
Coopers' Hill War Memorial Prize, 352
Co-Partnership. See *Labour*
Copes Feed-Water Regulator, Trenton Channel Power Station, 500*
Copper Alloys. See *Brass; Bronze; Gunmetal*: and *Alloys* under *Metallurgy*
— Behaviour during Hot Forging, 331*. See 313
— Country, Lake Superior, Earth Resistivity Measurements, 697
— Ore Extraction, Ferric Sulphate-Sulphuric Acid Process, 30
— Prices. See *Metal-Price Diagrams*
— Steam Pipe, Failure of, S.S. "Egyptian Transport," 518
— Zinc-Lead Ores, Metallurgy of, 759, 787
— See also *Metallurgy*
Core Making, Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 67*
Cornish, H. J., the Late, 486
Corrosion, Atmospheric, of Metals, Electrical Resistance Measurements, 338
— of Boilers, German Investigations, 777
— and the Fatigue of Metals, 232
— and Life of Steel-Framed Buildings, 433
— Resisting Cast Irons, Composition of, 338
— Sea Water, Ferrous and Non-Ferrous Metals and Alloys, 314
— — Water, Over-Stressed Iron and Steel, 630
— Tests, Standard, 80
— and Tube Failures, High-Pressure Boilers, Lakeside Power Station, 25*, 55*
Corrugated Pipes, Water Flow in, 110*
Corundum, Canadian, Sources, Properties and Uses, 29
Cost Estimating and Design of Merchant Ships (Review), 34
Coste, J. H., on River Pollution, 612
Costing System, Foundry, Metropolitan-Vickers Electrical Co., Ltd., 123
Cottrell Dust Precipitator, Trenton Channel Power Station, 533*
Couplings, Fire Hose, Standard Specification, 813
— Flexible, for Motor-Car Generators and Magnetos, 52*
"Courageous," H.M. Aircraft Carrier, 257*
Coursey, P. R., on Dielectrics for Condensers, 133
Cowper-Coles, S., Electrolytic Iron Process, 339*
Cox & Danks, Ltd., Salvage Operations, Ex-German Battle Cruiser "Moltke," 737*
Cox, E. C., on Southern Railway Electrification, 481
Cox's Ignite Combustors, Surface-Combustion Gas Burners, 221*
Cracking of Concrete, American Investigations, 495
— of Lead-Cable Sheathing, Investigations, 297, 299*, 334*
— Petroleum, Use of Screened Radiated Heat, 818
— Season, of Cartridge Cases, 304, 312*
Cracks in Railway Axles, Magnetic Detector for, Acton Works, 646
Crane Chains, Wrought Iron, Causes of Failure, 515, 618*, 652*, 741. See 2*
— Electric, Travelling, Coal-Handling, Stourport Power Station, 11*
— Equipment, Southampton Docks, 802. See 809
— Floating, Concrete-Block Handling, Bari Harbour, Italy, 247*
— — 150-ton, Southampton Docks, 802. See 809
— Roof, Level-Luffing Type, Avonmouth Docks, 567*, 591
— 100-ton Spring Balance for, 256*
Crankless Gas Engine, Michell (National Gas Engine Co., Ltd.), 220*
Creep Arnco Iron at High Temperature, 672
— Stress, Limiting, Steel for Boiler and Superheater Construction, 723. See 703, 728
Creeper Track fitted to Hand Barrow, 224*
Crewe Locomotive Works, Reorganisation, 358, 362*. See 355. See *Errata*, 414
Cribs, Timber, Foundations of Wharf Walls, Port of Quebec, 184*
Crispations of Liquids, 644
Critical Points, Metals. See *Metallurgy*
Crompton Jubilee Celebrations, 451
Crompton Parkinson, Ltd., Ammeters and Voltmeters, Alternating-Current Multi-Range, 68
Crooke, A., on the New Plant of the Appleby Iron Co., Ltd., 551*, 584*. See 578
Crosby Valve and Engineering Co., Ltd., Automatic Temperature-Control Apparatus, Steam and Water, 273*
Crossley Bros., Ltd., 150-h.p. Three-Cylinder Horizontal Oil Engine, 204*
Croydon Aerodrome, Wireless Equipment, 190*
Crude Oil Engines. See *Engines, Oil*
Cruisers. See *Warships*
Crushing Plant, Ore, Appleby Iron Co., Ltd., 586
Crystals, Chemical Properties of, 613
— Single, of Metals, Investigations of Fatigue Phenomena, 232, 264. See 200
Crystalline Structure of Metals. See *Metallography; Micro-photographs*
Cunningham, Dr. B., on Western Ports of North Atlantic, 34* 97*, 183*
Cupola Plant, Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 67
— with Poumay Auxiliary Tuyeres, 744*
"Curl Curl," Double-Ended Screw Steamer, Sydney Harbour, 399*. See 408
Current, Electric. See *Electric*
Curtis, Col. J, on Education in the Royal Air Force, 263
Cut-Outs, Fusible, Pressures Produced on Blowing, 715
Cutter Guard for Milling Machines (A. Herbert, Ltd), 255*
— Milling. See *Milling* under *Machine Tools*
— Cutting Machine for Machine-Tool Turnings, 284*
— Metal, Use of Liquid Oxygen, French Railway Workshops, 694*
— Tools, Hot Hardness and Cutting Properties, 51
— — Research Committee, Report on Cutting Temperatures, Discussion, 51
Cycle Industry, Position and Prospects, 139
— Motor. See *Motor Cycle*
— Thermodynamic, Atkinson, Citroën Petrol Engine, Kinematics of, 277*
— — for Locomotives, 103
Cylinders, Motor-Car Engine, Grinding Machine for, 174
— Railway, Vacuum-Brake, Wrought Steel, Prestall, 144
Cylindrical Grinding Machine. See *Grinding Machine* under *Machine Tools*
Cyrenaica, Economic and Commercial Conditions, Report, 130

D.

DALLAS Machine and Locomotive Works, Gerlinger Hydraulic Carrier, 13*
Dalley, C., on Fire Risks in the Petroleum Industry, 296. See 360
Dalmarnock Gas Works, Maclaurin Smokeless-Fuel Plant, 128*
Damping Gear, Hydraulic, for Earthquake Effect on Bridge, 5
Dams, Hydro-Electric Power Plants, Progress in Design, 759, 786
— Multiple Arch, Lake Pleasant, Arizona, 159*
— St. Francis, Los Angeles, Failure of, 419* 452*, 547, 580, 644
— Stresses in, Investigation by Rubber Models, 709
— — Wilson and Gore's Experiments, 709
— Water Power Development in Italy, 237
Danish State Railways, Motor Train Ferry "Korsör," 41*
Dantzig Shipbuilding Industry, 811
Davey, H., the Late, 485*. See 515
Davey, Paxman & Co., Ltd., Cold-Starting Heavy Oil Engines, 224*
Davidson & Co., Ltd., Dust Collectors for Boiler Plants, 222*
Davies, S. J., on the Kinematics of the Andreau Differential-Stroke Engine, 277*
Davies, V. C., Extensometer for Determination of Young's Modulus, Concrete, 131*
Davits, Listproof, Vreugdenhil, 505*. See 541
— Welin-Maclachlan, S.S. "Duchess of Bedford," 675*
Daylight, Artificial, Production and Properties, 142
— Lighting of Buildings by, 401*, 716*
De Laval Steam Turbine Co., Auxiliary Turbo-Generators, Trenton Channel Power Station, 629*; Hot-Well and Feed Pumps, 662*
De-Superheater for Steam, Automatic Control, Crosby, 275*
"Dee Why" Double-Ended Screw Steamer, Sydney Harbour, 399*. See 408
Deflections of Flat Plates, Experimental Investigation, 31*. See *Erratum*, 83
Delaware River Suspension Bridge, Design, 1
Denmark. See *Danish*
Density Changes, Cold-Working of Metals, 313
Depreciation, Valuation and the Rate Base (Review), 693
Derbyshire Silica Firebrick Co., Ltd., Friden Works, Use of Oil Fuel, 336*
Desch, Prof. C. H., on the Chemical Properties of Crystals, 613
Design and Manufacture in Engineering, 641
Destroyers. See *Warships*
Destructor Plant, Electric Power Generation, Govan, 549
Detonation in Petrol Engines, Investigation of Dopes, 673. See *Errata*, 713
Detroit Edison Co., Trenton Channel Power Station, 341*, 369*, 433*, 499*, 532*, 603*, 629*, 660*, 690*, 782*, 795*
— River, Suspension Bridge over, 357
Deutsch, F., the Late, 644
Diagrams, Alignment, Flow of Viscous Liquids through Pipes, 498*
— Metal-Price. See *Metal-Price Diagrams*
Diamond Dies, Compound, Wire Drawing, 102
Die-Casting Shops, Metropolitan-Vickers Electrical Co., Ltd., 122*
Dielectrics, Cable, Permeability to Air and Impregnating Compounds, 655
— for Condensers, Properties of, 133
— Schering Bridge for Testing, Cambridge Direct-Reading Type, 50*
Dies Diamond, Compound, Wire Drawing, 102
Diesel Engine Users' Association, Report on Working Costs of Diesel Engines in Electric Power Stations, 514. See LETTER, 540. See also 545; Diesel Engines for Peak Loads in Power Stations, by M. Gercke, 545; Discussion on Production of Liquid Fuel from Coal, Introduced by D. Brownlie, 671. See LETTER, 738.
— Engines. See *Engines, Oil, Diesel: Marine Propulsion*
Differential-Stroke Petrol Engine, Citroën, Kinematics of, 277*
Diffusion, Grain Growth in Metals by, 696
Digging Machine. See *Excavating Machine*
Dilatometric Investigations, Aluminium and Aluminium Alloys, 297, 337*

Dimensional Theory, Application to Steam-Nozzle Flow, 80
Dines, W. H., the Late, 22
Dipleidoscope Prisms, Properties of, 644
Directories. See LITERATURE INDEX
Disc Friction, Impulse Turbine Wheels, Formula for, 296
Disputes, Trade. See *Labour*
Dissolved Gases, Influence on Brass Ingots, 313, 366*
Dividing Head, Optical, for Machine Tools, 326
Docks, Dimensions of Approaches, 725, 749*
— Floating, for Singapore Naval Base, 84*
— — at Southampton, 802
— Graving and Floating, Port of Boston, 98
— Lighting, Use of High-Pressure Gas, 809
— London, Proposed Roads Improvements, 19
— Mersey, Management and Trade, 634
— Royal Edward, Avonmouth, Extension of, 565*, 591*. See 644
— Southampton, Development of, 800*, 809
— Wall, Ferro-Concrete, Sectional Construction, Royal Edward Dock Extension, Avonmouth, 568*
Dockyards, Naval, British, Administration, 249
Domestic Electric Lighting and Heating, Effect on Load Factor, 704, 724
— Uses of Electric Power, 738
— Water-Softening Plants, Ideal Home Exhibition, 483
Dominion Machinery Co., Ltd., Sanding Machine, 509*
Don, River, Linking up with River Volga, 715
Doncaster Power Station, Extensions, 511
Donovan & Co., Switch Plug, 255*
Dopes, Anti-Knock, Action in Petrol Engines, 673. See *Errata*, 713
Dorman, Long & Co., Ltd., Steel Arch Bridge, Newcastle-on-Tyne, 266*; Sydney Harbour Bridge, Progress, 467*, 559*. See *Erratum*, 540; Tests of Structural Members, Sydney Harbour Bridge, 697*
Dorman, W. H., & Co., Ltd., Flexible Coupling, Motor Car Generators and Magnetos, 52*
Double-Helical Gears. See *Gears*
— Reduction Gears, Marine. See *Marine Propulsion*
Dovel, J. P., on Improvements in Blast-Furnace Construction, 696
Doxford Marine Oil Engine, Comparisons with Still Engine, 39. See 47
Drainage Areas, Flood Discharge, 760, 788*
— Chicago, and the Great Lakes, 126*. See 62*, 114*, 137
— Manchester, Rainfall and Run-off Ground, 760, 789*
— Syphons, Upper Jhelum Canal, 20
Draining Sumps, Penberthy Automatic Pump for, 509*
Draught, Induced, Trenton Channel Power Station Installation, 533*
Drawing Brass Cartridge Cases, Investigations of Cracking, 304*, 312
— Office Practice, Standard Specifications, 146
Drayton Regulator and Instrument Co., Ltd., Automatic Regulator for Vulcanisers, 460*
Dredging and Dredging Appliances (Review), 141
— and Land Reclamation, Royal Edward Dock Extension, Avonmouth, 566*
— Work, Port of Quebec, 183
Drills and Drilling Machines. See *Machine Tools*
Drinking Water, Microscopy of (Review), 780
Drop Forgings, Production Metropolitan-Vickers Electrical Co., Ltd., 124*
— Tests. See *Tests (Materials)*
Dry Dock. See *Dock*
Dryers, Coal, Pulverised-Fuel Plant, Trenton Channel Power Station, 435*
"Duchess of Bedford," S.S., Canadian Pacific Railway Co., 675*. See 711
Duckham, Sir A., on Fuel Industries and the Chemical Engineer, 611
Duddell Oscillograph High Voltage Work, 49
Dunoyer System, Mercury-Vapour Pump, 101
Dust, Atmospheric, in Mines, Sampling, Impinger Plate Method, 290
— Coal, Explosions of. See *Coal Dust*
— — See also *Pulverised Coal*
— Exhausting Plant, Coal Breakers, Trenton Channel Power Station, 435*, 436*
— Extraction, Railway Rolling Stock, Acton Works, 646*
— Flue, Boiler Plants, Collectors for (Davidson & Co., Ltd.), 222*
— Precipitator, Cottrell, Trenton Channel Power Station, 533*
— Separating Induced-Draught Fan, 428*
Dvorkovitz System, Low-Temperature Carbonisation, 72*
Dwight, A. S., on Sintering of Floated Concentrates, 818
Dye, Dr. W. D., Vibrations of Piezo-Electric Resonators, 644
Dynamic Balancing Machine, Rotors, Metropolitan-Vickers Electrical Co., Ltd., 657*
Dynamometer, Hydraulic Traction, for Ploughing, 538*
Dynamos. See *Generators, Electric; Turbo-Generators*
Dyson, Sir F., on Physics in Astronomy, 612

E.

EARTH Pressure on Sheet Piling, 303
— — Theories of, 674
— Resistivity Measurements, Lake Superior Copper Country, 697
— Temperature, Fluctuations in, 608
Earthquake Effect on Bridge, Hydraulic Damping Gear for, 5
East Africa, Trade and Commerce, Report, 273
Echo-Sounding Gear, Improved Form, 103
Eclipse Hack-Saw Blades, High-Speed Steel, 639
Economics, Industrial, Engineering Outlook, 21, 61, 91, 139, 171, 248, 294, 324, 357, 388
— — See also *Labour*
— Railway. See *Railway*
Economics, Value of Safety Precautions, 77
Economiser, Fuel, Green's High-Pressure Type 221*
— Motors, Starting and Control Gear, 85*, See 145*
— Steel Tube, Trenton Channel Power Station, 532*
— Treatise on (Review), 472
Edging and Sawing Machine, Wood (J. Sagar & Co., Ltd.), 508*
Edinburgh, Portobello Power Station, Visit of Institution of Electrical Engineers, 811; Switchgear, 815*

Education :

Apprentice Training Scheme, Royal Air Force, 263
Apprenticeship System, Metropolitan-Vickers Electrical Co., Ltd., 816
Architects, Training of, 263
Boot and Shoe Industry, Technical Education in, 262
Busk Studentship in Aeronautics, 487
Chemical Engineers, Institution of, Memorandum on Training, 52
Coopers' Hill War Memorial Prize, 352
Education of Engineers, Conference of Verein Deutsche Ingenieure, 778
— in the Gas Industry, 800
Electrical Engineers, Institution of, Associate Membership Examination, 268; Students' Premiums, 320
Faraday House, Faraday and Maxwell Scholarships, 174; Prospectus, 268
Gas Engineers, Institution of, Entrance Examinations, 174; Candidate's Proposal Forms, 268
Manchester Municipal College of Technology, Evening Courses, 638
Metals, Institute of, Student Membership Regulations, 268
Royal Air Force, Education in, 263
— Scholarships and Free Studentships, Syllabus, 804
Scholarships, Engineering, Swansea University College, 174
— Faraday and Maxwell, Faraday House, 174
— Royal, and Free Studentships, Syllabus, 804
— Science, Examination Syllabus, 606
— Surveyors' Institution, 320
— Whitworth, Regulations, 804
Science Scholarship, Examination Syllabus, 606
Sir John Cass Institute, Lectures on Fuel, 147
Structural Engineers, Institution of, Manual on Training, 202
Supervising Electrical Engineers, Association of, Competition for W. E. Highfield Shield, 316
Surveyors' Institution, Scholarships, 320; Entrance Examinations, 638
Swansea University College, Engineering Scholarships, 174
Technical Institutions, Association of, Annual Meeting, 262
University College, Swansea, Engineering Scholarships, 174
Whitworth Scholarship Awards, 24; Regulations, 804
See also PARAGRAPH INDEX

Efficiency of Boiler Plants. See *Boiler Plants*
— of Engines. See *Engines; Trials*
— Thermal, Standards of, Internal-Combustion Engines, 10
Egerton, A. C., on Engine Knock and Related Problems, 673. See *Errata*, 713
"Egyptian Transport," S.S., Failure of Copper Steam Pipe, 518
Eisenwerke Weserhütte, A.-G., Cable-Laying Machine, 681*
Ejectors, Air, Two-Stage, Metropolitan-Vickers Electrical Co., Ltd., 659*
Elastic Hysteresis, Experiments on, 295
— Modulus, Concrete, Extensometer for Determination, 131*

Electric :

Accumulator Locomotives, Coal Handling, Stourport Power Station, 12*
— Trucks, Southampton Docks, 802. See 809
Agriculture, Electricity in (Review), 693
Alternating-Current Rectifier. See *Rectifier* (below)
Alternator. See *Generator* and *Turbo*
Ammeter, Moullin High-Frequency, 655*
— and Voltmeters at Physical and Optical Societies' Exhibition, 68, 69*, 101
Arc Furnace. See *Furnace, Electric*
— Welding. See *Welding*
Arcing, Pressures Produced in Closed Vessels, 715
Armature Coils, Manufacture, Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 405*, 731*
Battery. See *Accumulator* (above)
Bridge, Schering, Testing Insulating Materials, Direct-Reading, Type, 50*
British Electrical Development Association, Work of, 388, 739
Cable, Bitumen-Laid, Explosion at Royal Institution, 80
— Cracking of Lead Sheathing, Investigations, 297, 299*, 334*
— Dielectrics, Permeability to Air and Impregnating Compounds, 655
— Laying Machine, Weserhütte, 681*
— Lead-Sheathed, Automatic Plumber for Jointing, 254*
— 132,000-volt Oil-Filled, Design, Construction and Installation, 177*
Central Stations. See *Power Stations*
Circuit Breakers. See *Switchgear*
Coils, Armature, Manufacture, Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 405*, 731*
Condenser, Air, Variable, Sullivan-Griffiths Precision Type, 237*

Electric—*continued*.

Condenser, Properties of Dielectrics, 133
— Type Bushings, Transformers, 403*
Conductivity, Aluminium Alloys and Bronzes, 301*. See 312
Constants, Galvanometers and Fluxmeters, Graphical Determination, 338
Cooking and Heating Apparatus, British Industries Fair, 252
Cranes. See *Cranes*
Crompton Jubilee Celebrations, 451
Cut-Outs, Fusible, Pressures Produced on Blowing, 715
Dielectrics, Cable, Permeability to Air and Impregnating Compounds, 655
— for Condensers, Properties of, 133
Dynamo. See *Generator; Turbo-Generator*
Electrical Apparatus, Physical and Optical Societies' Exhibition, 49*, 68*, 101*. See 142, 175, 237*, 400*
— Code, Canadian Standard, and British Electrical Fittings, 230
— Development Association, British, Work of, 388, 739
— Engineering Industry, British, and Foreign Competition, 172
— — Scientific Invention and Progress in, 755
— Fittings, British, Canadian Market, 230
— — Plugs and Sockets, Standard Specification, 59, 257
— Machinery, British and Foreign, Comparisons of Efficiency, 172
— — Fundamentals of Design (Review), 564
— — Manufacture and Testing. See *Metropolitan-Vickers Electrical Co., Ltd.*
— — Moments of Inertia of Rotors, Experimental Determination, 213*. See LETTER, 614
— Research Association, Report, 201
Electricity Commissioners, Charges for Electricity in London, 20; Circular on Bitumen-Surrounded Cables, 80; Statistics of Electricity Supply, 356, 450; Central England Electricity Scheme, 454*; North-West Midlands Electricity District, 546; North-West England and North Wales Electricity Scheme, 811*
— Physico-Technical Theory of (Review), 530
— Private Supply, Caerphilly Urban District Council *versus* Griffin, 19
— (Supply) Act, 1926, Effects of, 17, 737
Electro-Farming, (Review), 693
Electrolytic Iron, Inception and Development, 339*
Electroplating. See *Electro*
Field Rheostats, Standard Specification, 306
Frequency Meter, Warren Master, 69*
— Changer, 5,000-kw., Stourport Power Station, 144
Furnaces. See *Furnaces*
Fuses, Pressures Produced on Blowing, 715
Galvanometer Constants, Graphical Method of Determining, 338
— Vibration, Schering, 101*
Generating Stations. See *Power Stations*
Generator. See *Generator* and *Turbo*
Heating and Cooking Apparatus, British Industries Fair, 252
— Electric, Trash Screens, Shawinigan Falls Power Plant, 514
— — Normalising of Overstrained Steel, 632, 682*
Hydro-Electric Power Plants. See *Power Plants*
Hygrometry, Electrical Methods, 487
Induction Furnace. See *Furnace*
— Motors. See *Motors, Electric*
— Type Meters (Everett, Edgcumbe & Co., Ltd.), 69*; (Nalder Brothers & Thompson, Ltd.), 69
Instruments, Manufacture and Testing, Metropolitan-Vickers Electrical Co., Ltd., 815*
— Moving Coil, Graphical Determination of Constants, 338
Insulating Bushings, Condenser Type, Transformers, 403*
— Materials, British Industries Fair, 253
— — Manufacture, Metropolitan-Vickers Electrical Co., Ltd., 403*
— — Paper, Cloth and Fibre, Microscopical Examination, 620*
— — Schering Bridge for Testing, Cambridge Direct-Reading Type, 50*
Insulators, Pot-Head Type, for 132,000-volt Oil-Filled Cables, 178*
Jointing Lead-Sheathed Cables, Automatic Plumber for, 254*
Light and Electricity, Relationship, Modern Theories, 201
Lightning, Protection of Oil Tanks from, 360. See 296
Locomotives. See *Locomotives, Electric*
London, Charges for Electricity in, 20
Machinery, Electrical, Principles of Design (Review), 141
Machines. See *Generators; Motors; Turbo*
Magnetos. See *Magnetos*
Mains. See *Cables* (above)
Mercury-Arc Rectifiers, Principles and Circuits (Review), 173
Meter, Average-Recording, Electric Power Supply, 393*
— Induction Type (Everett, Edgcumbe & Co., Ltd.), 69*; (Nalder Bros. & Thompson, Ltd.), 69
— Manufacture and Testing, Metropolitan-Vickers Electrical Co., Ltd., 815*
Micanite Insulation, Manufacture, Metropolitan-Vickers Electrical Co., Ltd., 403*
Motors. See *Motors, Electric*
Moving-Coil Instruments, Graphical Determination of Constants, 338
Oil Switch. See *Switchgear*.
Oscillograph, Duddell, for High Voltage Work, 49

Electric—*continued*.

Piezo-Electric Resonators, Mode of Vibration, 644
Planing Machines, Electric Drive for, Metropolitan-Vickers Electrical Co., Ltd., 730
Plugs and Sockets, Standard Specification, 59, 257
Potentiometer, Recording, with Hot-Wire Motor, Cambridge, 49*
Power. See *Power*
— Stations. See *Power Stations*
Prospecting for Ores, Electrical Method, 697
Pyrometer. See *Pyrometer*
Quartz-Plate Piezo-Electric Resonators, Mode of Vibration, 644
Railways. See *Railways*
Rectifier, Alternating-Current, Synchronous Motor Type, for Kinematograph Projectors, 254*
— Mercury-Arc, Principles and Circuits (Review), 173
— and Valves, Treatise on (Review), 472
Relays, Directional (Everett, Edgcumbe & Co., Ltd.), 69* (Nalder Brothers & Thompson, Ltd.), 69
— Parmotor Electro-Magnetic, 411*
Research Association, Electrical, Annual Report, 201
Resistance, Brass, Bronze and Aluminium Bronze, Effect of Heat Treatment, 492*
— Measurements, Atmospheric Corrosion of Metals, 338
— Water, Load Tests of Turbo-Generators, Metropolitan-Vickers Electrical Co., Ltd., 763*
— Welding. See *Welding*
Resistivity, Earth, Measurements, Lake Superior Copper Country, 697
Resonators, Piezo-Electric, Mode of Vibration, 644
Rheostats, Field, Standard Specification, 306
Röntgen Rays. See *Röntgen*
Rotary Converters, Performance of, Standard Specification, 235
Single Phase. See *Generators; Motors; Power; Locomotives; Railways*
South-East England Electricity Scheme, Criticisms of, 17
Starters, Motor. See *Motors, Electric*
Steel Manufacture. See *Metallurgy*; and *Furnace, Electric*
Storage Battery. See *Accumulator* (above)
Street Railways. See *Tramways*
Substation. See *Substation*
Switchgear. See *Switchgear; Motors, Electric*
Tariffs, Electric Power, Effect on Consumption, 388
Telegraphy. See *Telegraphy*
Telephony. See *Telephony*
Thermometer. See *Thermometer*
Three-Phase. See *Generators; Motors; Power; Locomotives; Railways*
Traction. See *Locomotives; Electric; Railways; Tramways*
Tramways. See *Tramways*
Transformers. See *Transformers*
Turbo-Generators. See *Turbo-Generators*
Voltmeters, Physical and Optical Societies' Exhibition, 68, 69*, 101
Welding. See *Welding*
Winding Gear. See *Winding*
Wireless Telegraphy. See *Telegraphy*
Wireless Telephony. See *Telephony*
X-Rays. See *Röntgen Rays*
See also PARAGRAPH INDEX

Electrical Apparatus, Physical and Optical Societies' Exhibition, 49*, 68*, 101*. See 142, 175, 237*, 400*
— Development Association, British, Work of, See, 739
— Engineering, Development of, Crompton Jubilee Celebrations, 451
— — Industry, British, and Foreign Competition, 172
— — Industry, Position and Prospects, 61
— — Scientific Invention and Progress in, 755
— — and Scientific Research (Review), 286
— — Works, Bruce Peebles & Co., Ltd., 811
— — Works, Metropolitan-Vickers Electrical Co., Ltd. See *Metropolitan-Vickers*
— Engineers, American Institute of, Papers on 132,000-volt Cable Design, 177*

Electrical Engineers, Institution of :

Presentation of Portrait of Mr. L. B. Atkinson, 174
Annual Dinner, 197
Associate Membership Examination, 268
Students' Premiums, 320
Kelvin Lecture on the Revolution in Physics, by Sir O. Lodge, 506
Faraday Medal, Award to Prof. J. A. Fleming, 506
Electrification of the Pietermaritzburg-Glencoe Section of the South African Railways, by F. Lydall, 650*, 679*. See 402, 481
Practice and Progress in Combustion of Coal as Applied to Steam Generation, by F. H. Rosencrants, 742
Some Considerations of the Economics of Electric Power Production by W. T. Townend, 742

Summer Meeting, Glasgow :
Inaugural Proceedings, 811
Visits and Excursion, 812

Scottish Centre :
Boiler Plant Progress, by F. H. Rosencrants, 323

Electrical Engineers, Supervising, Association of. See *Supervising*
—Machinery, British and Foreign, Comparisons of Efficiency, 172
— — Fundamentals of Design (Review), 564

Electrical Machinery, Manufacture and Testing See *Metropolitan-Vickers Electrical Co., Ltd.*
— — Moments of Inertia, of Rotors, Experimental Determination, 213*. See LETTER, 614
Electrical Power Engineering Co. (Birmingham), Ltd., Motors with Epicyclic Reduction Gearing, 252*
— Research Association, Annual Report, 201
Electricity Commissioners. See under *Electric*
— (Supply) Act, 1926, Effects of, 17, 737
— Physico-Technical Theory of (Review), 530
Electro-Farming, Treatise on (Review), 693
— Hydraulic Steering Gear, S.S. "Duchess of Bedford," 676*
— Technical Commission, International, Acceptance Tests of Steam Turbines, 709
Electrolux, Ltd., Water Softeners, 483
Electrolytic Iron, Inception and Development, 339*
— Corrosion. See *Corrosion*
Electrons and Modern Physical Theories, 506
Electroplating of Chromium, Investigations, 550
Elements, Transformation of, 315*, 360*, 387*, 422*
Ellerman Liner "City of Roubaix," 175
Elevating Pugmill for Clay (H. & E. Lintott), 509*
Elevators and Conveyors, Mail Bags, Post Office Tube Railway, 309*
— Grain, Granaries at Avonmouth Docks, 595*
— Pneumatic, Travelling, for Grain, Avonmouth Docks, 591*
Elliott Brothers (London), Ltd., Vacuum Thermocouples, 101*; Averaging Recorder for Electric Power Supply, 393*
Ellison, G., Switchgear at British Industries Fair, 206*
Ellson, G., on Effect of Electrification on Railway Design and Maintenance, 720. See 700, 814
Elsden, L. V., on Drainage Syphons on the Upper Jhelum Canal, 20
Elsinore Shipbuilding Co., Ltd., Motor Train Ferry "Korsör," 41*
Emanueli, L., on 132,000-volt Cables, 177*
Emery Wheels. See *Grinding* under *Machine Tools*
Empire, British, Organisation of Research Work, 385
— Grown Timber, Exhibition, Imperial Institute, 166
— Trade, Development of, Importance of Personal Contact, 482. See 612
"Empirestar," S.S., Explosion of Stop-Valve Chest, 518
Employees. See *Labour*
Employment. See *Labour*
Endurance Tests. See *Alternating Stress* under *Tests* (*Materials*)
Engines, Aero. See *Aeronautics*
— Diesel. See *Engines, Oil, Diesel; Marine Propulsion; Motor Ships*
— Gas, 10-h.p. Michell Crankless Type (National Gas Engine Co., Ltd.), 220*
— — Steam Generation by Waste Heat, 241*. See 233, 264, 272.
— — Use in Electric Power Stations, 743
— Heat, Treatise on Applied Thermodynamics (Review), 780
— Internal-Combustion, Heavy Types, Development, 727, 752
— — Combustion, Light, High Speed, Development of, 727, 751
— — Combustion, Standards of Efficiency, 10
— Locomotive. See *Locomotive*
— Motor Car. See *Engines, Petrol*
— Oil, Automatic Temperature Control of Cooling Water, Crosby, 276*
— — at British Industries Fair, 204*, 224*, 256
— — Cold Starting, with Spring Injection and Paxman-Lentz Exhaust Valve Gear (Davey, Paxman & Co., Ltd.), 224*
— — Diesel, Development of, 727, 752
— — Diesel, and 450-kw. Electric Generators, Auxiliary Machinery, S.S. "Duchess of Bedford," 675*
— — Diesel, High-Speed, Recent Developments, 727, 752, 777
— — Diesel, at Leipzig Fair, 327*
— — Diesel, for Locomotives, 726, 751
— — Diesel, Marine, Advantages of Preheating Air, 40
— — Diesel, Marine, 4,000-h.p. Burmeister & Wain Type, Motor Train Ferry "Korsör," 42*
— — Diesel, Marine, Comparisons with Steam Engines and Turbines, 378*, 389, 430*
— — Diesel, Marine, Comparisons of Still and Doxford Types, 39. See 47
— — Diesel, Marine, Comparisons of Two-Stroke and Four-Stroke Cycle, 39, 47
— — Diesel, Marine, Design for Low Weight and High Speed, 89
— — Diesel, Marine, Effects of Turbulence, 40
— — Diesel, Marine, Experimental Investigations, Admiralty Engineering Laboratory, 407, 425*, 462*
— — Diesel, Marine, Gas Pressures behind Piston Rings, 462*
— — Diesel, Marine, M.A.N., Two-Cycle Double-Acting Type, Tests of, 88
— — Diesel, Marine, Mechanical Efficiency of 426, 462*. See 407
— — Diesel, Marine, for Naval Service, 89
— — Diesel, Marine, 2,100-h.p. North-Eastern Werkspoor, M.S. "Greystoke Castle," 380*
— — Diesel, Marine, Present Position, 39, 47
— — Diesel, Marine, Progress in Adoption, 701, 721
— — Diesel, Marine, Sheide-Sulzer Type, for M.S. "Sibajak," 71*
— — Diesel, Marine, Skew Gears for Camshaft Drives, Wear and Efficiency of, 427*
— — Diesel, Marine and Stationary, Design and Construction (Review), 173
— — Diesel, Marine, Steam Generation by Waste Heat, 243, 272. See 233, 264
— — Diesel, Marine, 7,000-h.p., Sulzer, 412*
— — Diesel, Marine, Supercharging in, 41, 426. See 407, 462
Engines, Oil, Diesel, Marine, United States Shipping Board Conversion Programme, 88
— — Diesel, Marine, and Vibration of Ships, 199. See LETTER, 227
— — Diesel, Marine, Volumetric Efficiency of, 40
— — Diesel, Marine, 3,725-h.p. Wallsend-Sulzer Type, M.S. "Zealandic," 525*
— — Diesel, Use in Electric Power Stations, 514, 545. See LETTER, 540
— — Diesel, 65-h.p. for Motor Vehicles (Maschinenfabrik Augsburg-Nurnberg A.G.), 328*
— — Diesel. See also *Motor Ships; Marine Propulsion; Diesel Engine Users' Association*
— — Marine, Design of Small Vessels (Review), 173
— — Marine, under Construction, Lloyd's Statistics, 484
— — Heavy Type, Development, 727, 752
— — High-Speed, Development of, 229
— — Horizontal, Solid-Injection Type (Robey & Co., Ltd.), 226*
— — 55-h.p., Single-Cylinder, Horizontal Semi-Diesel Type (Fielding & Platt, Ltd.), 226*
— — 150-h.p. Three-Cylinder Horizontal, Crossley-Premier, 204*
— — Two-Cycle, and 8-kw. Electric Generator (Petters, Ltd.), 204*
— — 60-h.p., Two-Cylinder Vertical, Two-Stroke Type (Marshall, Sons & Co., Ltd.), 204*
— — See also *Tractors* and PARAGRAPH INDEX
— Petrol, Action of Anti-Knock Dopes, 673. See *Errata*, 713
— — Aeroplane. See *Aeronautics*
— — Citroën Differential-Stroke Type, Atkinson Cycle, Kinematics of, 277*
— — Light High-Speed Types, Development, 727, 751
— — Motor Car, Cylinder-Grinding Machine, 174
— — See also *Aeronautics; Motor Cars*
— Room Artificers, British Navy, Promotion of, 674
— Steam, Compound, 800-h.p., Uniflow Heat-Extraction Type (Galloways, Ltd.), 318*
— — Development of, 710, 755
— —Historical Exhibits, Institution of Civil Engineers' Conversazione, 709
— — Marine, Comparisons with Turbines and Oil Engines, 378*, 389, 430*
— — Marine, under Construction, Lloyd's Statistics, 484
— — Marine, Geared, in Early American Cruisers, 54
— — Marine. See also *Marine Propulsion; Turbines*
— — Work of James Watt (Review), 82
— Winding. See *Winding*
— See also PARAGRAPH INDEX
Engineers' Association, British, Discussion on Rating Proposals, 775
— Civil Service, Status of, 484
— in-Charge, Institution of, Annual Dinner, 546
— Chemical, and the Fuel Industries, 611
— Consulting, Association of. See *Consulting Engineers*
— Education. See *Education; Apprenticeship*
— and Physicists, Relationship, 169. See LETTER, 227
— Institutions. See *Institutions*
— Naval, Promotion of Engine-Room Artificers, 674
— Registration of, in Australia, 780
— Value of Mathematics to, 807
Engineering and Allied Industries, Position and Prospects, 21, 61, 91, 139, 171, 248, 294, 324, 357, 388
— Apprentices. See *Apprentices*
— Civil, Standard Construction Methods (Review), 780
— Conference, Charter Centenary Celebrations, Institution of Civil Engineers. See *Civil Engineers*
— Design and Manufacture in, 641
— Education. See *Education; Apprenticeship*
— Electrical, Development of, Crompton Jubilee Celebrations, 451
— — and Scientific Research (Review), 286
— — Works, Bruce Peebles & Co., Ltd., 811
— — Works of Metropolitan-Vickers Electrical Co., Ltd. See *Metropolitan-Vickers*
— Export Trade and National Saving, 484
— Inventions, Century of, 709, 755. See 707
— Industry, Electrical, British, and Foreign Competition, 172
— — Report of Committee on Industry and Trade, 576
— — Wages in (Review), 563
— Institute of Canada, Electrically-Heated Trash Screens at Shawinigan Falls Power Plant, by C. R. Reid, 514
— Laboratories. See *Laboratories; National Physical*
— Marine, Lloyd's Statistics, 484
— Periodicals, Index to, 790
— Standards Association, Specifications, Two-Pin Wall Plugs and Sockets, 59, 257; Drawing Office Practice, 146; Steel Bars for Machined Parts, 185; Tubular Tramway Poles, 228; Electrical Performance of Rotary Converters, 235; Malleable-Iron Castings, 276; Field Rheostats, 306; Bolt Heads, Nuts and Washers, 308; Steel Fishplates, 340; Illumination Glassware, 400; Grey Iron Castings, 480; Electric Power Switchboards, 494; Colliery Materials, 579; Tramway Trackwork, 623; Gauges of Broken Stone and Chippings, 666; Paints and Varnishes, 756, 803; Fire-Hose Couplings, 813; Index to Standard Specifications, 429; Standard Pipe Flange Tables, 715; Standard Tolerances, Reamer Diameters, 729
— — Association, Canadian, Electrical Code, and British Electrical Fittings, 230
— and Science, Relationship, 169. See LETTER 227.
— Scientific Invention and Development of, 709, 755. See 707
Engineering Societies. See *Institutions*
— Thermodynamics Applied to (Review), 529
— Trade, Sales Organisation, 778
— Value of Mathematics in, 807
— Works. See *Works*
English Electric Co., Ltd., Storage-Battery Locomotives, Coal Handling, Stourport Power Station, 12*; Electrical Equipment, Post Office Tube Railway, 153*, 214*, 250*. See 92*, 309*; Camshaft-Control Gear, Electric Trains, 155*. See 214*; Bhira Power Station, Tata Hydro-Electric Power Co., 747*, 771*, 819*; Hydro-Electric Equipment, Lanarkshire Water Power Stations, 791*. See 767.*
Enox Hack Saw for Sheet Materials, 368*
Eötvös Torsion Balance, Use in Geology and Prospecting, 219, 696
Epicyclic Reduction Gearing for Electric Motors, 252*
Equilibrium Diagrams, Alloys. See *Metallurgy*
Erecting Shop, Trafford Park Works, Metropolitan-Vickers' Electrical Co., Ltd., 658*
— — Crewe Locomotive Works, Reorganisation, 363*. See 355, 359, 414
— of Bridges. See *Bridges*
Errors in Hob-Cut Helical Gears, 465*, 531* 598*
Essen, Annual Conference, Verein Deutsche Ingenieure, 735, 777
Estimating, Cost, and Design of Merchant Ships (Review), 34.
Etching, Detection of Strain in Steel by, 79
Ether and Modern Physical Theories, 506
Eumuco, A. G., 500-ton Forging Press, 282*
European War, Italian Navy in (Review), 83
Eutectic Alloys. See *Alloys* under *Metallurgy*
Evans, E. C., on Correlation of Blast-Furnace Data, 577
Everest, Dr. A. B., on the Influence of Nickel on Cast Iron, 579; Microscopic Examination of Insulating Materials, 620*
Everett, Edgcumbe & Co., Ltd., Exhibits at Physical and Optical Societies' Exhibition, 69*
Ewing, Sir J. A., Forrest Lecture on a Century of Invention, 709, 755. See 707
Excavating Machine for Cable Laying, the Weserhütte, 681*
— — Oil-Engine Driven (Orenstein & Koppel), 285*
Excavation Work, Royal Edward Dock Extension, Avonmouth, 566*
Exhibition, British Industries Fair, Birmingham, 203*, 220*, 252*. See LETTER, 299
— Building Trades, 474*, 508*
— Educational and Commercial, Verein Deutsche Ingenieure, 736
— Empire-Grown Timber, Imperial Institute, 166
— Historical, Institution of Civil Engineers Charter Centenary Celebrations, 708
— Ideal Home, Domestic Water-Softening Plants, 483
— Leipzig Fair, Technical Exhibits, 282*, 326*, See LETTER, 382
— National, and Steel and Power Show, Toronto, British Participation, 482, 612
— Scientific Apparatus, Physical and Optical Societies', 49*, 69*, 101*. See 142, 175, 237*, 400*; Royal Society Conversazione, 643, 655*, 779
— — Trade, German Machine Tools at, 382
— — See also PARAGRAPH INDEX
Expansion Joint, Concrete Retaining Walls, 468*
— Links, Locomotive Valve Gear, Grinding Machine for, 521*
— Tanks, 132,000-volt Oil-Filled Cables, 177*
Experimental Tank. See *Tank*
— Station, Buxton, Work of, 28; Investigations of Coal-Mining Explosives, 715
— Work, H.M. Navy, Pre-War and Present Cost, 687
Explosion, Boiler. See *Boiler Explosion*
— Coal Dust, Work of Safety in Mines Research Board, 28
— Colliery. See *Colliery Explosions*
— and Fires on Oil-Tank Steamers, 87
Explosives, Changes in Ammonium Nitrate, 655
— Coal Mining, Investigations at Buxton Experimental Station, 715
Export Trade. See *Trade;* and *Industries* in PARAGRAPH INDEX
Express Boiler and Superheater, Rapid Steam Raising, 303*
Extensometer, Determination of Young's Modulus for Concrete, 131*
Extruded Parts in Constructional Work, 778
Eyebars, Carquinez Strait Bridge, California, Tests, 5.

F.

FABER, Dr. O., on a Deep-Water Jetty, Bevan's Cement Works, 445
Facing Machine. See *Machine Tools*
Factors of Safety in Boiler Practice, 386
Factories, Assessment for Rating, 258
— Proposed Rates Reduction, 775
— Welfare Work in. See *Labour*
— and Workshops, and the Landlord and Tenant Act, 451
Factory Accidents. See *Accidents*
— Management. See *Works Management*
Fans, Induced-Draught, Dust-Separating, 428*
— — Draught, Trenton Channel Power Station, 533*
— Motors, Starting and Control Gear, 85* See 145*
— Standardised Tests, Report, 357
— Ventilating, Trenton Channel Power Station, 795*
Faraday, M., on the Rating Proposals, 775
— House, Faraday and Maxwell Scholarships, 174; Prospectus, 268
— Medal, Award to Prof. J. A. Fleming, 506
— Notebooks, Lectures on, 235
— Society, Experiments on Elastic Hysteresis, by Prof. B. P. Haigh, 295
Fardi Range Finder, 58*
Farming. See *Agriculture; Tractors*
Fatigue, Industrial. See under *Labour*
— Tests of Metals. See *Alternating Stress* under *Tests* (*Materials*)
Feathers, Peacock, Fading in Ultra-Violet Light, 655. See 779
Federation of British Industries, British Exhibit at National Exhibition, Toronto, 482. See 612
— of Iron and Steel Manufacturers, Annual Dinner, 674
— of Wire Rope Manufacturers, 645
Feed Pumps. See *Pumps*
— Water, Automatic Temperature-Control Apparatus, Crosby, 275*
— — Heater, Economiser, Green's High Pressure, 221*
— — Heaters, Economisers, Steel-Tube, Trenton Channel Power Station, 532*
— — Heaters, Economisers, Treatise on (Review), 472
— — Heater, Explosion on S.S. "Montclare," 518
— — Heaters, High-Pressure, Metropolitan-Vickers Electrical Co., Ltd., 659*
— — Heating, Progressive System, Trenton Channel Power Station, 782*
— — Heating, Waste Gases from Boilers (Review), 472
— — for High-Pressure Boilers, Treatment with Sodium Phosphate, 55*
— — Regulator, Copes, Trenton Channel Power Station, 506*
— — Softener. See *Water-Softener*
— — See also *Water*
Fell, E. W., on Strain in Steel, 79
Fennell, W., on Overhead Lines Design, 545
Ferric Sulphate-Sulphuric Acid Ore Extraction Process, 30
Ferro-Concrete, Adhesion between Concrete and Steel, 239
— — Arch Road Bridge, River Tweed, Berwick, 527*, 615*
— — Columns, Effect of Concrete Shrinkage on Stress Distribution, 515
— — Coal Bunker, Stourport Power Station, 11*
— — Construction, Jetty and Pump House, Barking Power Station, 319
— — Construction, Steel Shuttering for, 569*, 570
— — Construction, Strength of Semi-Circular Hooks, 495
— — Multiple-Arch Dam, Lake Pleasant, Arizona, 159*
— — Patch, Salvage of S.S. "Nagara", 163*
— — Piles, Deep-Water Jetty, Northfleet, 445
— — Piles, Manufacture and Driving, Pier at Vancouver, 202; Royal Edward Dock Extension, Avonmouth, 567*
— — Piles, Recent Developments, 719
— — Piles, Sinking by Compressed Air, 510
— — for Railway Work, 700, 719
— — Sleepers, Railway Track, 700. See 720
— — Surge Tanks, Lanarkshire Water Power Plants, 768*
— — Transit Sheds and Granaries, Avonmouth Docks, 569*. See 591*
— — Water Pipes, Bill's Rubber Joint 803*
— — Wharf, Sectional Construction, Dock Extension, Avonmouth, 568*
— — See also PARAGRAPH INDEX
Ferrocrete Cement, Properties and Uses, 699, 719
Ferry, Railway Car, Strength and Deflection of Hulls, 54
— Steamers, Double-Ended Screw Type, Sydney Harbour, 397*, 408
— Train, Motor, the "Korsör," Danish State Railways, 41*
Fertilisers, Artificial, German Synthetic-Ammonia Industry, 636
— Nitrogenous, British Investigations, 643
Fettke, Prof. C. R., on Increasing Yield of Oil Wells by Compressed Air, 818
Fibres, Quartz, Direct-Reading Micrometer for, 655*
— Vulcanised, Miscroscopic Examination, 621*
Field, S., on the Metallurgy of Lead-Zinc-Copper Ores, 787. See 759
— Rheostats, Standard Specification, 306
Fielding & Platt, Ltd., 55-h.p. Horizontal Oil Engine, 226*
Films, Selenium, Production by Bubble Blowing, 572
Filter Nozzle for Petrol-Filling Pumps, 212*
— Pressure, Torrent, for Industrial Water Supplies, 223*
— Slow-Sand, Walton, Metropolitan Water Board, 788*. See 760
— Streamline, for Oily Bilge Water, Japanese Navy, 150*
Filtration, Water for Domestic Purposes, 760, 787*
Finance, National Saving and Engineering Export Trade, 484
Finlayson, D., on the Viscosity of Lubricating Oils at High Temperatures, 628
Fires and Explosions on Oil Tank Steamers, 87
— Extinguishing Installation, Carbon-Dioxide, Lux System, Barking Power Station, 441*
— Hose Couplings, Standard Specification, 813
— Oil Tank, Causes and Prevention, 296. See 360
— Service, Motor Ladder and Pump, Leicester Fire Brigade, 132*
Firebox, Water-Tube Locomotive Boilers, Experimental Results, 103
Firebricks. See *Refractory Materials*
Fisher, J., on Earth Resistivity Measurements, 697
Fishplates, Chromium-Steel, Behaviour in Service, 618. See 602, 632
— Steel, Standard Specification, 340
Fitting of Shafts in Holes. See *Gauges*
Flames, Gas, Products of Combustion of, 769
— Oxy-Acetylene, Temperature of, 777
Flanges, Pipe, Standard Tables, 715
Flat Plates, Deflections of, Experimental Investigations, 31*. See *Erratum*, 83
Fleming, Prof. J. A., Award of Faraday Medal to, 506

Fleming, R., on the Life of Steel Buildings, 433; on Wind Stresses in Steel-Framed Buildings, 625*
Flexible Coupling for Motor-Car Generators and Magnetos, 52*
Walls, Earth Pressure on, 303
Flight. See *Aeronautics*
Floating-Bush Type Locomotive Driving Axle Box, 473*. See 347*
— Crane. See *Crane*
— Dock. See *Dock*
Floats for Railway Wagons, Strength and Deflection of Hulls, 54
Flockhart, A. P., on Variable Flow in Open Channels, 688*
Flood Discharge from Catchment Areas, 760, 788*
London, River Thames, from Tidal Wave, 48, 77, 294. See LETTER, 74
Floors, Concrete, for Heavy Duty, 495
Flotation, Froth, Ore Concentration, Gas Sorption in, 818
— — Ore Concentration, Sintering of Concentrates, 818
— — Washing Tests, Coal from Wigan Seam, 414
Flue-Dust Collectors for Boiler Plants (Davidson & Co., Ltd.), 222*
— Gases, Cottrell Dust Precipitator, Trenton Channel Power Station, 533*
— — Separating Dust from, Induced-Draught Fan for, 428*
Fluorescence of Minerals in Ultra-Violet Light, 655
Fluxmeter Constants, Graphical Method of Determining, 338
Flying Boats. See *Seaplanes* under *Aeronautics*
Forest Products Research Board, Report on Kiln-Seasoning of Timber, 348
Forgings, Drop. See *Drop Forgings*.
— Hammers. See *Hammers* under *Machine Tools*
— Hot, Non-Ferrous Metals and Alloys, 313, 331*
— Press. See *Press* under *Machine Tools*
Forrest Lecture, by Sir J. A. Ewing, on a Century of Invention, 709, 755. See 707
Forster, A. L., on a Free-Curve Attachment for Ornamental Lathes, 584*
Foundations in Pervious Soils, Hydrostatic Uplift, 514
— St. Francis Dam, Los Angeles, Failure of, 419*, 452*, 547, 580, 644
— Theories of Earth Pressure, 674
— Timber Crib, for Wharf Walls, Port of Quebec, 184*
Foundry Association, German, Conference, 811
— Cost Keeping, Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 123
— Cupola, with Poumay Auxiliary Tuyeres 744*
— Methods and Equipment, Metropolitan-Vickers Electrical Co., Ltd., 65*, 122*
— Work, Present and Future Problems, 811
— — See also *Die Casting*
— See also *Castings; Moulding*
Fowler, J., & Co. (Leeds), Ltd., Petrol-Driven Shunting Locomotive, 8*
Fowler, Sir H., on Steam and Internal-Combustion Locomotives, 751. See 726
Frames, Locomotive, Jig for Erecting, Crewe Works, 362*. See 359
France, Water Power in, Present Position, 200
— See also *French*
Francis Turbines. See *Turbines, Hydraulic*
Franklin Institute, Early Dynamo Tests, 484
Frazil Ice Formation, Prevention by Electric Heating, Shawinigan Falls Power Plant, 514
Freas Electric Oven, 101
Fredenhagen, W., Box-Nailing Machine, 283*
Free-Curve Attachment for Ornamental Lathes, 584*
French Lick Meeting, American Society for Testing Materials, Proceedings (Review), 530
Railway Workshops, Use of Liquid Oxygen for Cutting and Welding, 694*
— See also *France*
Frequency Changer, 5,000-kw., Stourport Power Station, 144
— Meter, Warren, for Power Stations, 69*
Friction, Blade and Disc, Impulse Turbine Wheels, Formula for, 296
Friden Works, Derbyshire Silica Firebrick Co., Ltd., Use of Oil Fuel, 336*
Friend, Dr. J. N., on the Corrodibility of Ferrous and Non-Ferrous Metals and Alloys, 314; on the Corrosion of Over-Stressed Iron and Steel, 630
Frodingham Iron Ore Field, 551*. See 584
Froth Flotation, Ore Concentration, Gas Sorption in, 818
— — Ore Concentration, Sintering of Concentrates, 818
— — Process, Washing Tests, Coal from Wigan Seam, 414
Froude Experimental Tank, Comparisons of Model Propellers in Air and Water, 409; Investigations of Effect of Fins in Propeller Aperture, 438, 461*
Fry, L. H., on Experimental Results on a Three-Cylinder Compound Locomotive, Discussion, 103
Fry's (London), Ltd., Enox Hack Saw for Sheet Materials, 368*
Fuel Consumption, Electric Power Stations, Statistics, 450, 799
— Industries, Work of Chemical Engineer, 611
— Injection, Spring System, Davey-Paxman Oil Engine, 225*
— Institute of, Operating Experiences with 1,300-lb. Steam Pressure, by J. Anderson, 25*, 55*
— Liquid, Production from Coal, 671. See LETTER, 738
— — See also *Oil Fuel*
— Low-Temperature Carbonisation of Coal. See *Coal, Low-Temperature Carbonisation*
— Motor, Alcohol Production from Vegetable Wastes, 78
— — Action of Anti-Knock Dopes, 673. See *Errata*, 713
Fuel, Motor, Production from Coal, 671. See LETTER, 738
— — Production of Petrol from Natural Gas 63
— — See also *Alcohol; Gas; Motor; Petrol; Producer*
— Oil. See *Oil Fuel*
— Pump. See *Pump*
— Research Board, Report on Power Alcohol from Vegetable Materials, 78; Report on Wigan Seam, Lancashire Coalfield, 414; Development of Low-Temperature Carbonisation Processes, 671. See LETTER, 738
— — Station, Greenwich, Investigations on Reactivity of Coke, 276, 578. See 800
— for Ship Propulsion, Comparisons of Coal and Oil, 378*, 389, 430*
— Smokeless. See *Coal, Low-Temperature Carbonisation*
— Solid and Liquid, Methods of Utilising, 701, 722
— Testing, Sodium-Peroxide Bomb Calorimeter, 623*
— See also *Coal; Oil; Gas; Pulverised Coal*
Furnaces, Blast, Correlation of Data, 577
— — Methods of Cleaning Gas, Comparisons, 601, 819. See 586
— — Plant of Appleby Iron Co. Ltd., 551*, 585*
— — Rebuilding Lining of, 696
— — Use of Waste Heat, 742
— Crucible, Brass-Melting, Metropolitan-Vickers Electrical Co., Ltd., 122*
— Electric Arc, Steel Manufacture, Energy Losses, 150
— — at British Industries Fair, 252
— — Contact-Resistance Type, Dr. W. Rosenhain's, 655
— — High-Frequency Induction, Valve Operated, 572
— — Induction, High-Vacuum, Study of Gases in Metals, 696
— — Wild-Barfield High-Temperature, 101
— Gas-Fired Annealing, Surface-Combustion Type (Metropolitan Fuel Co., Ltd.), 221*
— Ingot-Soaking Pits, Appleby Iron Co.'s Works, 587
— Open-Hearth, Appleby Iron Co.'s Works, 551*, 586
— — Hearth, with Auxiliary Hearth, 547
— — Hearth, Basic, Development, 547
— — Hearth, Crewe Locomotive Works, 365*
— — Hearth, Pulverised-Fuel Firing, 808
— — Steel Works, Steam Generation by Waste Heat, 241*, 272. See 233, 264
— See also *Coke Ovens; Cupolas*
Fuses, Electrical, Pressures Produced on Blowing, 715
Fusion Welding. See *Welding*

G.

GAINFORD, Lord, on British Trade, 546
Galloways, Ltd., 800-h.p. Heat-Extraction Uniflow Compound Engine, 318*
Galvanometers. See *Electric*
"Gannet," Shallow-Draught Gunboat, 333
Gardner, J., the Late, 571
Gardner, S. A., on Tests of a Marine Diesel Engine, 88
Garnets, Abrasive, Canadian Sources, Properties and Uses, 29
Gas Appliances, Therapeutical Uses, 770
— Blast-Furnace, Methods of Cleaning, Comparisons, 601, 819. See 586
— Bubbles, Production in Liquids by Submerged Orifices, 30
— Burners, Surface-Combustion, Cox's Ignite Combustors, 221*
— Carbon Dioxide. See *Carbon Dioxide*
— Coal Carbonisation, Effects of Temperature, Size of Coal, and Blending, 769
— Coke Oven. See *Coke Oven*
— Distributing System, Tottenham, 769
— Engine. See *Engine, Gas*
— Engineers, Institution of, Entrance Examinations, 174; Candidate's Proposal Forms, 268; Application for Royal Charter, 387. Cardiff Meeting: Presidential Address on the Progress of the Gas Industry, by H. D. Madden, 743; New Morriston Works of the Swansea Gas Light Co., by W. H. Johns, 743; Report of Committee on Examination of Products of Combustion, 769; Report on Studies in Carbonisation, 769; Economic Aspects of High-Pressure Distribution, by S. Lacey, 769; Extension and Modification in the Tottenham Distributing System, by H. C. Smith, 769; Report of Committee on Disposal of Liquid Effluents from Gas Works, 769; Report of Committee on Gas for Therapeutical Purposes, 770; Gas Supply East of Suez, by S. B. Johnson, 771; Some Applications of Chemistry in Gas Making, by H. Hollings, 799; Report of Gas Research Scholar, Mr. F. J. Dent, on the Reactivity of Coke, 800; Report of Committee on Refractories, 800; Report of Committee on Gas Education Scheme, 800; Miscellaneous Reports, Gas Holders, Wrought-Iron Tubing and Coal Analysis, 800.
— Fired Furnaces. See *Furnaces*
— Flames, Products of Combustion of, 769
— and Gas Works. See also PARAGRAPH INDEX
— Heated Panels for Heating Buildings, 139
— High-Pressure, Use in Block Lighting, 809
— Holders, Report of Committee on, 800
— — Waterless, Advantages of, 702, 722
— Industry, Education in, 800
— — Progress of, 743
— — Refractory Materials, Reports on, 800
— Manufacture, Chemistry in, 799
— Natural Carbonic Acid, Compressing Plant, Bongwan, Natal, 46
— — Utilisation in South Persian Oilfield, 341
— — from Petroleum, and Derivatives, 63
— Phosgene, Properties of, 668
— Plant, Horizontal Retorts, Crewe Locomotive Works, 366*
Gas Producer. See *Producer*
— Retort Settings, Heat Insulation of, 800
— from Sewage Sludge, Power Production from, 162
— Town, High-Pressure Distribution, Economic Aspects, 769
— Welding. See *Welding*
— Works, Colombo, 771
— — Dalmarnock, Maclaurin Smokeless-Fuel Plant, 128*
— — Disposal of Liquid Effluents, 769
— — Morriston, Swansea Gas Light Co., 743
— — Steam Generation by Waste Heat, 242*, 272. See 233, 265
Gases, Dissolved, Influence on Brass Ingots, 313, 366*
— Flue, Cottrell Dust Precipitator, Trenton Channel Power Station, 533*
— Ionisation of. See *Ionisation*
— in Metals, Study by High-Vacuum Induction Furnace, 696
— See also *Acetylene; Carbon Dioxide; Carbon Monoxide; Hydrogen; Nitrogen; Oxygen, &c.*
Gasoline. See *Petrol; Engine, Petrol; Aeronautics*
Gaster, L., the Late, 44
Gate Valve, Rotary, Circulating-Water System, Trenton Channel Power Station, 691*
Gatewood, Capt. R. D., on Diesel Engines for United States Shipping Board, 88
Gauges of Broken Stone and Chippings, Standard Specification, 666
— Making and Maintenance, Metropolitan-Vickers Electrical Co.. Ltd., 278*
Gauging Flow of Streams (Review), 564
— Limit, Investigations at Skoda Works, 373*
Gear, Change-Speed, Riesler Hydro-Mechanical, 444*
— Cutting Machines. See *Machine Tools*
— Helical, Hob Cut, Accuracy of, 465*, 531*, 598*
— Permissible Errors in Pitch, 280*
— Skew, Camshaft Drives, Diesel Engines, Wear and Efficiency, 427*
— Steering. See *Steering*
— Tooth Measuring Machine, Metropolitan-Vickers Electrical Co., Ltd., 280*
— Variable-Speed, P.I.V., Milling Chain Wheels for, 256*
Geared Turbines, Marine. See *Marine Propulsion*
Gearing, Reduction, Epicyclic, for Electric Motors, 252*
General Electric Co., Ltd., Exhibits at British Industries Fair, 204*
General Electric Co. (Schenectady), Turbo-Generators, Trenton Channel Power Station, 604*; Transformers, Circuit Breakers and Switchgear, 797*, 798*
Generating Machine, Gear. See *Gear* under *Machine Tools*
— Station. See *Power Station*
Generators, Electric, 17,500-kw., Alternating-Current, Bhira Hydro-Electric Station, 819*. See 747*, 771*
— — Alternating-Current, Lanarkshire Water Power Stations, 793*
— — Development of, and Power Station Design, 728, 754*
— — 450-kw., Diesel-Engine-Driven, Auxiliary, S.S. "Duchess of Bedford," 675*
— — Direct-Current, Early American Tests, 484
— — Fundamentals of Design (Review), 564
— — Manufacture and Testing. See *Metropolitan-Vickers Electrical Co., Ltd.*
— — Moments of Inertia of Rotors, Experimental Determination, 213*. See LETTER, 614
— — Motor Car, Flexible Coupling for, 52*
— — Motor-Driven, for Arc Welding (Metropolitan-Vickers Electrical Co., Ltd.), 224*
— — 8-kw., Oil-Engine-Driven (Petters, Ltd.), 204*
— — Permanent-Magnet Type, High-Tension Current Supply to Wireless Apparatus, 224*
— — Principles of Design (Review), 141*
— — Standard Specification for Field Rheostats, 306
— — See also *Turbo-Generators*
Gennet, C. W., on Manufacture of Steel Rails, 696
Geology, Use of Eotvos Torsion Balance, 696. See 219
Geophysical Methods of Locating Minerals, 219, 696
Geophysics, Practical, Working Methods, 697
George, P. W., Experiments with Eotvos Torsion Balance, 697
Gercke, M., on Diesel Engines for Peak Loads, 545. See 514, 540
Gerlinger Motor Truck, 13*
German Association of Engineers. See *Verein Deutscher Ingenieure*
— Battle Cruiser "Moltke," Salvage Operations, 737*
— Foundry Association, Conference, 811
— Machine Tools at British Exhibitions, 382
— Synthetic-Ammonia Industry, 536
Germany, Economic and Financial Conditions in, Report, 157
— Leipzig Fair, Technical Exhibits, 282*, 326*. See LETTER, 382
Gibson, Prof. A. H., on Tidal Power, 785. See 759
Gilkey, Prof. H. J., Investigations of Coarse Aggregates for Concrete, 79
Girders, Plate, Design of, 262
— Stiffening, Suspension Bridges, Stresses in, 1
— See also *Beams; Bridges; Floors*
Glasgow, Dalmarnock Gas Works, Maclaurin Smokeless-Fuel Plant, 128*
— Meeting, Institution of Electrical Engineers. See *Electrical Engineers*
— Refuse Power Plant at Govan, 549
— Royal Technical College, Experiments on Turbine-Wheel Friction, 296
Glass, Bottle, Ultra-Violet Light Transmission through, 487
— Colourless, Casing by Coloured Glass, 616
— Opal, Analysis of, 487
Glass Technology, Society of, Note on Ultra-Violet Ray Transmission through Colourless Bottle Glass, by D. Starkie and Prof. W. E. S. Turner, 487; Analysis of Opal Glass, by W. Singleton and R. C. Chirnside, 487; New Facts arising from a Study of the Casing of Colourless by Coloured Glass, by Dr. S. English, Prof. W. E. S. Turner and F. Winks, 616
Glassware, Translucent, Illumination Fittings, Standard Specification, 400
Glencoe-Pietermaritzburg Section, South African Railways, Electrification, 650*, 679*. See 402, 481
Gloster Aircraft Co., Variable-Pitch Airscrew, 489*
Goethals, Major-Gen. G. W., the Late, 113
Gold Coast Colony, Takoradi Harbour, 455*
Goodman, J., on the Oil Film in Bearings, 416
Goods, Carriage by Passenger Train, Payment of Charges, 645
— Transport, Railway, Legal Position, 503
— — Railway, Suggested State Aid for Rates Reduction, 776
Goodwin, Barsby & Co., Ltd., Concrete Mixer, 475*
Gordon, J., & Co., Ltd., Hagan System of Automatic Boiler Control, 382
Goss, Dr. W. F. M., the Late, 581
Gouda Power Station, Flue-Dust Collector, 223*
Gough, Dr. H. J., Cantor Lectures on Fatigue Phenomena, 200, 232, 264; on Failures of Wrought-Iron Chains, 618*, 652*. See 515*, 741
Govan, Refuse Power Plant at, 549
Governing Gear, Davey-Paxman Cold-Starting Oil Engine, 225*
— — 1,500-kw. Turbo-Generator, Guildford Power Station, 713*. See 709
— — Sewer System, Pelton Wheels for Bhira Power Station, 771*, 747*
— — 50,000-kw. Turbo-Generators, Trenton Channel Power Station, 605*
Government Appointments, Allowance for Travelling Expenses, 615
— Control, Water Power, United States, Criticisms of Proposals, 642
— Railways. See *State Railways*
Grain Elevators, Port of Boston, 100; Port of Quebec, 183*
— Growth in Metals by Diffusion, 696
— Handling Machinery, Avonmouth Docks, 591*
— Travelling Pneumatic Elevator for, Avonmouth Docks, 591*
— Weighing Machines, Avonmouth Docks (W. & T. Avery, Ltd.), 596*, 597*
Gramophone Sound-Recording and Reproducing Apparatus, 400*
Granaries, Ferro-Concrete, Avonmouth Docks, 571*, 594*
Graphical Determination, Constants of Galvanometers and Fluxmeters, 338
Grasses, Production of Alcohol from, 78
Graving Dock. See *Dock*
Gravity Surveying in Great Britain, 697
Gray Lecture, Institution of Mechanical Engineers, on Marine Oil Engines, 39. See 47
Great Indian Peninsula Railway, Electric Locomotive for, 297*
— Lakes, Improvement for Navigation and Power Production, 126*. See 62*, 114*, 137
Green, E., & Son, Ltd., High-Pressure Economiser, 221*
Greenwich Fuel Research Station, Investigations on Reactivity of Coke, 276, 578. See 800
Gregson, Major W., on Waste-Heat Recovery, 241*, 272. See 233, 264
Grenoble, Electrolytic Iron Plant at, 339*
Gresley, H. N., on Steam and Internal-Combustion Locomotives, 751. See 726
"Greystoke Castle," M.S., Machinery of, 380*
Grid System, Power Transmission Lines, 704, 724
Griffin, J. J., & Sons, Ltd., Exhibits at Physical and Optical Societies' Exhibition, 101; Sodium-Peroxide Bomb Calorimeter, 623*
Griffiths, Dr. E., on Conductivity of Aluminium Alloys and Bronzes, 301*. See 312
Grimston, F. S., on the Season Cracking of Cartridge Cases, 304*. See 312
Grinding Machines. See *Machine Tools*
— Materials, Corundum and Garnet, Canadian Sources, Properties and Uses, 29
— — Siliceous, in Canada, Report, 519
— Mill, Paint, Single-Roller Type (S. Smith & Blyth, Ltd.), 475*
Grindstone Quarrying and Manufacture, Canada, 519
Ground Temperature, Fluctuations in, 608
Grove Road Power Station, Flue-Dust Collector, 223*
Guard, Milling-Cutter (A. Herbert, Ltd.), 255*
Guildford Power Station, 709. See 713*
Gun Factory, Early, at Vauxhall, 709
Gunboats, Shallow-Draught, for the Yangste-Kiang, 333*
Guy, H. L., on Steam-Turbine Practice, 752. See 727
Gwyer, Dr. A. G. C., on Aluminium Alloys, 179*, 210*

H.

HAALCK, H., on Working Methods of Practical Geophysics, 697
Haas, Dr. H., Dilatometric Study of Light Metals, 337*. See 297
Haase, Dr. H. G., on the Corrodibility of Cast Iron, 338
Hack-Saw Blades, Eclipse, High-Speed Steel, 639
— — for Sheet Materials, Enox, 368*
Haefely Type Ironing Machine, Insulation of Armature Coils, 405*
Hagan System, Automatic Boiler Control, 382

Hague, R. L., on Tank-Steamer Fires and Explosions, 87
Haigh Fatigue Tests of Lead, 335*. See 297
Haigh, Prof. B. P., Experiments on Elastic Hysteresis, 295
Hamburg, Escape of Phosgene at, 668
— Power Station, Diesel Engines for Peak Loads, 546. See 514, 540
Hammers. See *Machine Tools*
Hammond, Brig.-Gen. F. D., Report on Railways of 'Iraq, 776
Hand Barrow with Creeper Track, 224*
— — Transport of Bricks, Fatigue Investigations, 817
Hands, J., & Sons, Ltd., 125-ton Screw Press, 220*
Hansen, L., on Design of Superstructures for Passenger Ships, 54
Hanson, Prof. D., on the Influence of Nickel on Cast Iron, 579
Harbord, V., on Cleaning Blast-Furnace Gas, 601
Harbour, Boston, Arrangement and Equipment, 34*, 97*
— Breakwaters, Comparisons of Types, 725, 749
— Construction Works, Port of Bari, Italy, 245*. See *Addendum*, 382
— Dimensions of Approaches, 725, 749*
— Montreal, and the Improvement of the St. Lawrence, 127. See 62*, 114*, 137
— Quebec, Arrangement and Equipment, 183*
— San Francisco, Destruction of Timber Piling by Marine Boring Organisms, 757*
— South African Government, Report, 402
— Takoradi, Gold Coast Colony, 455*
— Vancouver, Bridge over, 151
See also PARAGRAPH INDEX
Hardening Metals. See *Heat Treatment* under *Metallurgy*
Hardness Tests. See *Tests* (*Materials*)
Hardstoft, Derbyshire, Oil Wells at, 451
Hargreaves, F., on Hardness of Cold-Worked Soft Metals and Eutectics, 313
Harvey, Frost & Co., Ltd., Grinding Machine for Motor-Car Engine Cylinders, 174
Hasse, M., A.-G., Turret Lathe and Riveting Machine, 282*
Hatfield, Dr. W. H., on Heat-Resisting Steels, 589, 622. See 601, 632
Hawkes, Prof. C. J., on the Marine Oil Engine, 39. See 47; on Internal-Combustion Engines for Marine Purposes, 721. See 701
Hawthorn, Leslie & Co. Ltd., Electric Locomotive, Great Indian Peninsula Railway, 297*
Hay, Major, J., the Late, 486
Heat Conductivity, Aluminium Alloys and Bronzes, 301*. See 312
— — of Boiler Scale, 777
— Engines. See *Engines; Turbines; Aeronautics*
— Extraction Steam Engine, 800-h.p. Uniflow Type (Galloways, Ltd.), 318*
— Insulation, Gas-Retort Settings, 800
— Resisting Steels, Mechanical Properties at High Temperatures, 589, 601, 622, 632
— Treatment of Metals. See *Metallurgy*
— Waste. See *Waste Heat*
Heater, Feed-Water. See *Feed-Water Heater*
— Gas, Surface-Combustion Type, Cox's Ignite Combustors, 221*
Heath, Sir F., on the Costs and Profits of Research, 546
Heating Buildings, Low-Temperature Radiating Panels, 139, 791
— and Cooking Apparatus, Electric, British Industries Fair, 252
— Curves, Alloys. See *Metallurgy*
— Electrical, Normalising of Overstrained Steel, 632, 682*
— — Domestic, Effect on Load Factor of Supply, 704, 724*
— — Trash Screens, Shawinigan Falls Power Plant, 514
— Feed-Water, Progressive System, Trenton Channel Power Station, 782*
— — Water, by Waste Gases from Boilers (Review), 472
— Steam, Automatic Temperature-Control Apparatus, Crosby, 273*
— — of Vulcanisers, Automatic Regulator, 460*
— and Ventilating Engineers, Institution of, Report on Standardised Fan Tests, 357
— and Ventilating System, Trenton Channel Power Station, 795*
Heenan & Froude, Ltd., Refuse Power Plant at Govan, 549
Hegenscheidt, W., Railway-Wheel Lathe, 283*
Heiland, C. A. on the Cartographic Correction for the Eötvös Torsion Balance, 697
Hele-Shaw Beacham Variable-Pitch Airscrew, 489*
— — Beale Filter, Oily Bilge Water, Japanese Navy, 150*
Helical Gears. See *Gears*
— Springs, Avoiding Permanent Set, 711*
Hematite Prices. See *Metal-Price Diagrams*
Hepworth, H. R., on Road Traffic, 750. See 726
Herbert, A., Ltd., 5½-in. Centre Capstan Lathe, 240*; Exhibits at British Industries Fair, 255*
Herbert, E. G., on Cutting Temperatures, Discussion, 51
Herminghausen-Werke, Centreless Grinding Machines, 326
Heterogeneity of Steel Ingots, Report, 583. See 600, 632
Higgins, G., Alignment Charts, Flow of Viscous Liquids through Pipes, 498*
High-Speed Steel. See *Steel*
— Temperature Tests. See *Tests* (*Materials*)
Highfield Shield, Competition for, 316
Highways. See *Roads*
Hilger, A., Ltd., Exhibits at Physical and Optical Societies' Exhibition, 49
Hill, Sir N., on Ocean Transport, 635
H.M.SS. See under *Warships*
Hob-Cut Gears, Helical, Accuracy of, 465*, 531*, 598*
Hobbing Machines, Gear. See *Gear* under *Machine Tools*
Hoffmann, G. H., on the Effective Moment of Inertia of H.M.S. "Wolf," 410
Hoists, Mine, Electrical, Design, Construction and Operation (Review), 694
Holes and Shafts, Fitting of, Investigations at Skoda Works, 373*
Holland, Gouda Power Station, Flue-Dust Collector, 223*
Hollings, H., on Chemistry in Gas Making, 799
Hollings & Guest, Ltd., Positive Action Rotary Pump, 224*
Holmes, A. B., the Late, 22. See *Erratum*, 54
Holtzapffel & Co., Ltd., Free-Curve Attachment for Ornamental Lathe, 584*
Honours List, New Years', 20
Hoolamite, Use for Estimation of Carbon Monoxide in Mines, 507
Hopper Dredger. See *Dredger*
Hordern, Mason & Edwards, Ltd., Power Presses for Deep Drawing, 396*
Horsley, M. D., on Viscosity of Lubricating Oils, 281
Hose Clip, Quick-Fastening Type, the "No Screw," 29*
— Couplings, Standard Specification, 813
Hot Forging, Non-Ferrous Metals and Alloys, 313, 331*
— Wire Motor, Recording Potentiometer, 49*
Hotchkiss, W. O., on Earth Resistivity Measurements, 697
Hours of Labour. See *Labour*
House-Refuse-Collecting Cart, with Screw Conveyor, 556*
— — Power Production from, at Govan, 549
Housing Schemes, London County Council, 48
Houston, Sir A. C., on Water Purification, 611; on Water for Domestic Purposes, 787*. See 760
Howard, J. & F., Ltd., Mail-Bag Containers, Post Office Tube Railway, 250*
Howden-Ljungström Air Preheaters, Shanghai Power Station, 685
Howell, S. E., the Late, 486
Hughes, H., & Son, Ltd., Exhibits at Physical and Optical Societies' Exhibition, 103
Humidity, Automatic Controller for, the Cambridge, 50*
— Control, Timber-Seasoning Kilns, 348
— Measurement, Electrical Methods, 487
Hunter, F. K. M., on Liquid Oxygen for Blasting, 818
Huson Superstellar Sextant, 103
Hutchinson, G. L., the Late, 303
Hydraulic Accumulator, Williams-Janney Pump for, 288*
— Damping Gear for Earthquake Effect on Bridge, 5
— Jump Phenomenon, Investigations, 689*
— Lifting Gear, Gerlinger Motor Truck, 13*
— Machine Tools. See *Machine Tools*
— Power Plant. See *Power Plant*
— Press. See *Press* under *Machine Tools*
— Pumps. See *Pumps*
— Traction Dynamometer for Ploughing, 538*
— Turbines. See *Turbines; Pelton Wheels; Power Plant*
Hydraulically-Operated Drop Valves, Galloway Heat-Extraction Engine, 318*
Hydraulics, New Theory of Silt and Scour, 307*
— Stream Gauging (Review), 564
— Treatise on (Review), 530
— Variable Flow in Open Channels, 688*
— Viscous Liquids, Flow through Pipes, Alignment Charts, 498*
— Water Flow in Corrugated Pipes, 110*
— See also *Irrigation; Water*
Hydro-Aeroplane. See *Seaplane* under *Aeronautics*
Hydrocarbons, Higher, of Coal Tar (Review), 372
Hydro-Electric Power Plant. See *Power Plant*
— Mechanical Change-Speed Gear, Rieseler, 444*
Hydrogen Sulphide, Physiological Effects, 349
Hydrostatic Uplift, Foundations in Pervious Soils, 514
Hygrometer for Automatic Humidity Control, the Cambridge, 50*
Hygrometry, Electrical Methods, 487
Hysteresis, Elastic, Experiments on, 295

I.

ICE Formation, Prevention by Electric Heating, Shawinigan Falls Power Plant, 514
— — River St. Lawrence, 63
— Problem, Hydro-Electric Power Plants, 759, 786. See 514
— and Regelation, Faraday's Notebooks, 235
— See also *Refrigeration*
Ideal Home Exhibition, Domestic Water-Softening Plants, 483
Illinois River, Pollution and Self Purification of, 544
Illumination of Buildings by Daylight, 401*, 716*
— Effect in Typesetting, 504
— Fittings, Standard Specification for Translucent Glassware, 400
— Research Committee, Report on Penetration of Daylight into Buildings, 401*; Investigations of Effects of Illumination in Typesetting, 504; Natural Lighting of Picture Galleries, 716*
— See also *Light; Lighting;* and *Lamps* under *Electric*
Impact Tests. See *Test* (*Materials*)
Imperial Institute, Exhibition of Empire-Grown Timber, 166
Impinger-Plate Method, Sampling Atmospheric Dust in Mines, 290
Import Trade. See *Trade*
Importers, Machinery, Association of, Policy, 779
Impregnation Plant, Varnish, Metropolitan-Vickers Electrical Co., Ltd., 407*
Impulse Turbines. See *Turbines*
Incorporated Municipal Electrical Association. See *Municipal*
Index to Engineering Periodicals, 790
India, Bhira Power Station, Tata Hydro-Electric Power Co., 747*, 771*, 819*
— Great Indian Peninsula Railway, Electric Locomotive for, 297*
— Rubber. See *Rubber*
Indian Government Ammunition Factories, Season Cracking of Cartridges, 304*, 312
— Import Trade, Report, 299
— Irrigation, Drainage Syphons, Upper Jhelum Canal, 20
— — Silting and Scouring in Channels, New Theory, 307*
Indicator, Temperature, Automatic, for Electrical Machinery (A. Reyrolle & Co., Ltd.), 206*
— Temperature Deviation, Cambridge Signal-Lamp Type, 50
Individual-Axle Drive, Electric Locomotives, Brown-Boveri, 298*
Indo-European Telegraph System, 209*
Induced-Draught Fan, Dust-Separating, 428*
— — Installation, Trenton Channel Power Station, 533*
Induction Furnace. See *Furnace, Electric*
— Motor. See *Motor, Electric*
— See *Electric*
Industrial Accidents. See *Accidents*
— Agreements and Disputes. See *Labour*
— Alcohol. See *Alcohol; Motor Fuels*
— Chemistry. See *Chemistry*
— Economics, Engineering Outlook, 21, 61, 91, 139, 171, 248, 294, 324, 357, 388
— — Report of Committee on Industry and Trade, 449
— — See also *Labour*
— Education. See *Education*
— Fatigue. See *Labour*
— Furnaces. See *Furnaces*
— Management. See *Works Management*
— Notes. See *Labour Notes* under *Labour*
— Premises and Plant, Assessment for Rating, 258
— — and Plant, Rating of, Government Proposals, 775
— Research. See *Research*
— Statistics, Need for Prompt Publication, 450
— Welfare. See *Labour*
Industries, Australian, Report on, 417
— Belgian, Report on, 610
— Chilean, Report on, 548
— Engineering and Allied, Position and Prospects, 21, 61, 91, 139, 171, 248, 294, 324, 357, 388
— German, Report on, 157
— Metal, Report of Committee on Industry and Trade, 576
— United States, Report, 466
— See also *Trade* and PARAGRAPH INDEX
Industry, Co-Partnership in. See *Labour*
— Electrical Engineering, British, and Foreign Competition, 172
— Engineering, Effect of National Saving on, 484
— — Wages in (Review), 563
— Gas, Progress of, 743
— Heavy-Chemical, Recent Developments, 643. See *Erratum*, 665
— Increased Use of Power in, 449, 467
— Iron and Steel, United States, Economic and Social Development, 467
— Pig-Iron, British, Position of, 674
— Shipbuilding, Dantzig, 811
— — and Need for National Economy, 389
— Shipping, Economic Position, 263
— and Trade, Committee on, Reports, 449, 576
— Value of Scientific Research, 643
Ingots, Brass, Influence of Dissolved Gases, 313, 366*
— Soaking Pits, Appleby Iron Co.'s Works, 587
— Steel, Report on Heterogeneity, 583. See 600, 632
Inland Navigation. See *Navigation; Canals; Rivers, &c.*
Insell, R. J. S., the Late, 414
Inspection Lamp for Barrels, &c. (Ceag, Ltd.), 253*
Institute of Transport. See *Transport*
— See *Institutions*
Institution, Royal. See *Royal Institution*
— Technical and Scientific. See *Acetylene and Welding Association, British; Aeronautical Society, Royal; Arts, Royal Society of; Automobile Engineers, Institution of; Ceramic Society; Chemical Engineers, Institution of; Chemical Industry, Society of; Chemistry, Institute of; Civil Engineers, Institution of; Consulting Marine Engineers and Ship Surveyors, Society of; Civil Engineers, American Society of; Consulting Engineers, Association of; Concrete Institute, American; Diesel Engine Users' Association; Electrical Engineers, American Institute of; Electrical Engineers, Institution of; Engineering Institute of Canada; Engineers-in-Charge, Institution of; Faraday Society; Franklin Institute; Fuel, Institute of; Gas Engineers, Institution of; Glass Technology, Society of; Heating and Ventilating Engineers, Institution of; Iron and Steel Institute; Junior Institution of Engineers; Manchester Association of Engineers; Marine Engineers, Institute of; Mechanical Engineers, Institution of; Mechanical Engineers, American Society of, Metals Institute of; Meteorological Society, Royal; Mining Engineers, Institution of; Mining and Metallurgical Engineers, American Institute of; Mining and Metallurgy, Institution of; Municipal Electrical Association, Incorporated; Naval Architects and Marine Engineers, Society of; Naval Architects, Institution of; Newcomen Society; North East Coast Institution of Engineers and Shipbuilders; Optical Society; Overhead Lines Association; Petroleum Technologists, Institution of; Physical Society; Physics, Institute of; Professional Civil Servants, Institution of; Royal Institution; Royal Society; Structural Engineers, Institution of; Supervising Electrical Engineers, Association of; Surveyors' Institution; Technical Institutions, Association of; Testing Materials; American Society for; Transport, Institute of**
Instrument Equipment, Trenton Channel Power Station, 784
— Electrical, Manufacture and Testing, Metropolitan-Vickers Electrical Co., Ltd., 815*
— Moving-Coil, Graphical Determination of Constants, 338
— Scientific, Physical and Optical Societies' Exhibition, 49*, 68*, 101*. See 142, 175, 237*, 400*; Royal Society Conversazione, 643, 655*, 779
— Transformers, Varnish Treatment of Coils, Metropolitan-Vickers Electrical Co., Ltd., 407*
— See also *Aeronautics; Electric*
Insulating Materials. See *Heat* and *Electric*
— — British Industries Fair, 253
Insulation. See *Heat; Electric*
Insurance, Workmen's. See *Labour*
Internal-Combustion Engines. See *Aeronautics; Engines; Motor Cars; Motor Boats; Tractors*
— Grinder. See *Grinder* under *Machine Tool*
International Combustion, Ltd., Short-Flame Burner for Pulverised Fuel, 182*
— Electro-Technical Commission, Acceptance Tests of Steam Turbines, 709
International Standard Electric Corporation, Exhibits at Royal Society Conversazione, 655
— Trade. See *Trade*
Inventions, Engineering, a Century of, 709, 755. See 707
— Scientific, and the Development of Engineering, 709, 755. See 707
— See also *Patents*
Iodine Pentoxide, Use for Estimation of Carbon Monoxide in Mines, 507
Ionisation of the Atmosphere, 546
'Iraq Railways, Report on, 776
— Telegraph System of, 209*
Iron Alloys. See *Metallurgy; Steel*
— Armco, Creep at High Temperatures, 672
— Case Hardening. See *Heat Treatment* under *Metallurgy*
— Corrosion. See *Corrosion*
— Electrolytic, Inception and Development, 339*
— Foundry. See *Foundry*
— Furnaces. See *Furnaces*
— Heat Treatment. See *Metallurgy*
— Manufacture. See *Furnaces, Blast; Metallurgy*
— Ore. See *Ore*
— Pig, Prices. See *Metal-Price Diagrams*
— Rolling Mills. See *Rolling Mills*
— Sheets and Tubes, Electrolytic Manufacture, 339*
— Sponge, Production of, Report, 361

Iron and Steel Institute :
Carnegie Scholarship Memoir on Strain in Steel, by E. W. Fell, 79
Autumn Meeting, Glasgow :
Economic and Social Development of the American Iron and Steel Industry by T. W. Robinson, 467
Spring Meeting, London :
Programme, 424
Report of Council, 547
Presentation of Bessemer Medal to C. M. Schwab, 577
Annual Dinner, 600
Reports of Discussions, 577, 600, 630
Discussion in Sheffield, 632
Presidential Address, by R. Talbot, on the Basic Open-Hearth Process, 547
Blast-Furnace Data and their Correlation, by E. C. Evans and F. J. Bailey, 577
Reactivity of Coke, by Dr. J. H. Jones, Dr. J. B. King and F. S. Sinnatt, 578
New Plant of the Appleby Iron Co., Ltd., by A. Crooke and T. Thomson, 551*, 584*. See 578
Fatigue-Resisting Properties of 0·17 per cent. Carbon Steel at Different Temperatures and at Different Mean Tensile Stresses, by H. J. Tapsell, 557*. See 578
Properties of Nickel Steels, with Special Reference to the Influence of Manganese, by J. A. Jones, 579. See 632
Influence of Nickel on Iron-Carbon-Silicon Alloys Containing Phosphorus, by Dr. A. B. Everest and Prof. D. Hanson, 579
Effect of Silicon on Tungsten Magnet Steel, by J. Swan, 554*. See 600, 632
Second Report of Committee on Heterogeneity of Steel Ingots, 583. See 600, 632
Comparison of the Most Important Methods Employed in the Cleaning of Blast-Furnace Gas, by V. Harbord, 601
Heat-Resisting Steels, Part II.—Mechanical Properties, by Dr. W. H. Hatfield, 589, 622. See 601, 632
Chromium-Steel Rails, by Dr. T. Swinden and P. H. Johnson, 617. See 602, 632
Study of the Resistance of Over-Stressed Wrought Irons and Carbon Steels to Salt-Water Corrosion, by Dr. J. N. Friend, 630
Rapid Normalising of Over-Strained Steel, by W. E. Woodward, 682*. See 632
Iron and Steel Industry, Report of Committee on Industry and Trade, 576
— — Industry, United States, Economic and Social Development, 467
— — Manufacturers, National Federation of, Annual Dinner, 674
— — Plant, Appleby Iron Co., Ltd., 551*, 584*. See 578
— — Works. See *Works*
— — See also PARAGRAPH INDEX
— Tests. See *Tests* (*Materials*)
— Welding. See *Welding*
— Wrought, Chains and Cables, Causes of Failure, 515, 618*, 652*, 741. See 2*

Iron, Wrought, Chain Links, Brittleness of, Effect of Proofing and Annealing, 2*
— — Over-Stressed, Corrosion in Sea Water, 630
— See also *Cast Iron; Steel; Pig Iron; Metallurgy*
Ironing Machine, Hacfely Type, Insulation of Armature Coils, 405*
Ironwork, Structural. See *Bridges; Floors; Columns; Roofs; Steelwork; Structures*
Irrigation, Arizona, Lake Pleasant Multiple-Arch Dam, 159*
— Canals, New Theory of Silt and Scour, 307*
— Channels, Variable Flow in, 688*
— Indian, Drainage Syphons, Upper Jhelum Canal, 20
— See also PARAGRAPH INDEX
Italian Navy in World War (Review), 83
Italy, Port of Bari, Harbour-Construction Works, 245*. See *Addendum*, 382
— Water Power Development, Dams for, 238

J.

JACKSON, E., the Late, 259
Japanese Navy, Stream-Line Filter for Oily Bilge Water, 150*
Jets, Mercury, Impact with Steel and Glass, 572
Jetty, Barking Power Station, Construction of, 319
Deep-Water, at Bevan's Cement Works, Northfleet, 445
Jig-Boring Machine, Metropolitan-Vickers Elecal Electrical Co., Ltd., 277*
—for Erecting Locomotive Frames, Crewe Works, 362*. See 359
Job, R., on Steels for Railway Work, 695
John Bull Pneumatic Hammers for Concrete Breaking, 222*
Johnson, C., the Late, 714
Johnson, L., on Autogenous Welding of Stainless Steel, 478
Johnson, P. H., on Chromium-Steel Rails 617*. See 602, 632
Johnson, S. B., on Colombo Gas Works, 771
Joint, Rubber, Billé, Ferro-Concrete Water Pipes, 803*
Jointing Lead-Sheathed Cables, Automatic Plumber for, 254*
Jones, J. A., on the Properties of Nickel Steel, 579. See 632
Jones, A. A., and Shipman, Ltd., Drilling Machines Geared Automatic Feed, 715*
Jones, Dr. J. H., on Reactivity of Coke, 578
Jones, L., on Backed-up Mills for Continuous Rolling, 696
Journals. See *Bearings*
Jung, K., Surface-Grinding Machine, 326
Junior Institution of Engineers, Annual Dinner, 549

K.

KARL-WETZEL Maschinenfabrik, Horizontal Boring and Drilling Machine, 282*
Kehoe, A. H., on 132,000-volt Cables, 177*
Keith & Blackman Co., Ltd., Dust-Separating Induced-Draught Fan, 428*
Kelley, F. C., on Grain Growth in Metals by Diffusion, 696
Kelvin Lecture on the Revolution in Physics, by Sir O. Lodge, 506
Kemna, J., Diesel-Engine-Driven Road Roller, 285*
Kemp Town Automatic Substation, Brighton, 649*
Kent, G., Ltd., Automatic-Control Gear, Hydraulic Turbines, 793*
Kent, J. L., Experiments on Propulsion of Single-Screw Ship Model, 461*. See 438
Kent, Dr. W. L., on Hot Forging of Metals and Alloys, 331*. See 313
Kenya, Trade of, Report, 273
Kerr, Prof. W., Formula for Turbine-Wheel Friction, 296
Kewley, J., on Petroleum Natural Gases and their Derivatives, 63
Kidde, W., & Co., Ltd., Fire-Extinguishing Installation, Barking Power Station, 441*
Kilmarnock Engineering Co., Ltd., Rolling Stock, Post Office Tube Railway, 216*
Kilns, Bee-Hive and Continuous, for Refractory Materials, Firing with Oil Fuel, 336*
— Cement, Utilisation of Waste Heat, 497, 562
— Rotary, Production of Sponge Iron, 361
— Seasoning of Timber, Report, 348
Kinematics of Citroen Differential-Stroke Petrol Engine, 277*
Kinematograph Projectors, Rectifier for, 254*
King, Dr. J. G., on the Reactivity of Coke, 578
King, J. F., on the Bending and Loading of Ships, 393*. See 391
" King George V," S.S., High-Pressure Turbine Results, 379. See 390; Boiler Explosion, 352
Kirkpatrick, Sir C. R. S., on Dock and Harbour Approaches, 749* See 725
Klingenberg Electric Power Station, 58
Knocking in Petrol Engines, Investigations of, 673. See *Errata*, 713
Kocks, Dr. F., Investigations on Oblique Rolling of Seamless Tubes, 269*
Koninklijke Maatschappij de Schelde, Diesel Engines for M.S. " Sibajak," 71*
Koninklijke Nederlandsche Grofsmederij, Tests of Chain Links, 2*
" Korsor," Motor Train Ferry, Danish State Railways, 41*
Koswa Stop Valve Superheated Steam, 327*
" Kota Radja " and " Kota Inten," M.SS., Listproof Davits for, 505*. See 541
Krupp, F., A.-G., Refuse-Collecting Cart with Screw Conveyor, 556*
Kryn & Lahy (1928), Ltd., Poumay System Cupola, 744*

L.

LABORATORY, Chemical Research, Teddington, Investigations of Low-Temperature Tar, 611
— Engineering, Admiralty, Experimental Investigations, Diesel Engines, 407, 425*, 462*
— Research, Brown-Firth, Tests of Heat-Resisting Steels, 598, 601, 622, 632
— See also *National Physical*
Labour :
Apprentice-Training Scheme, Royal Air Force, 263
Apprenticeship System, Metropolitan-Vickers Electrical Co., Ltd., 817
Coal Strike, Effects of, 450, 452
Co-Operation between Employers and Employed, Economic Importance, 636
Employment Statistics, Engineering and Allied Industries, 21, 61, 91, 139, 171, 249, 294, 324, 358, 388
Engineering Industry, Wages in (Review), 563
Industrial Accidents. See *Accidents*
— Economics, Co-Operation between Employers and Employed, 636
— — Modern Wages (Review), 346.
— Fatigue Research Board, Report on Weight-Carrying by Women, 185; Investigations of Effects of Illumination in Typesetting, 504; Report on Radiant Heating in Buildings, 791. See 139; Investigations of Wheel-Barrow Work, 817
— Welfare. See *Welfare* (below).
Labour Conditions and American Industrial Prosperity, 467
— Notes, 23, 53, 70, 100, 143, 176, 192, 236, 267, 287, 330, 349, 392, 423, 443, 488, 520, 537, 582, 616, 648, 665, 712, 744, 781, 814. See PARAGRAPH INDEX
— Organisation, Metropolitan-Vickers Electrical Co., Ltd., 816
— Lighting, Effect in Typesetting, 504
Railway, London, Midland & Scottish, Co-Operation Scheme, 636
Strike, Coal, Effects of, 450, 452
Trade Unions and the Law (Review), 564
Typesetting, Effect of Lighting on Output and Accuracy, 504
Unemployment in Germany, 157
— Statistics, Engineering and Allied Industries, 21, 358, 388
— and Trade Depression, 546
Wages, British Engineering (Review), 563
— Modern, Treatise on (Review), 346
Weight-Carrying for Women, Report, 185
Welfare Work, Metropolitan-Vickers Electrical Co., Ltd., 817
Women, Weight-Carrying by, Report, 185
Lacey, S., on High-Pressure Gas, 769
Ladder, Motor, and Pump, Leicester Fire Brigade, 132*
Laidlaw-Dunn-Gordon Vacuum Pumps, Trenton Channel Power Station, 663*
Lake Champlain, Early American Steamboats on, 549
— Pleasant, Arizona, Multiple-Arch Dam, 159*
— Superior Copper Country, Earth Resistivity, Measurements, 697
— Great, Improvement for Navigation and Power Production, 126*. See 62*, 114*, 137
Lakeside Power Station, Operating Experiences, High-Pressure Steam, 25*, 55*
Laminated Springs, Endurance Tests of Steel Plates, 419
— — 200-ton Press for Finishing, 283*
Laminations, Electrical Machinery, Stamping Plant for, Metropolitan-Vickers Electrical Co., Ltd., 186*
Lamp, Inspection, for Barrels, &c. (Ceag, Ltd.), 253*
Lanarkshire Hydro-Electric Power Co., Ltd., Water-Power Plants, 767* 791*
Lancashire Coalfield, Wigan Seam, Report on, 414
— Boiler. See *Boiler*
Lancashire Dynamo and Motor Co., Ltd., Exhibits at British Industries Fair, 253*
Lancashire Shipping Co., Ltd., M.S. " Greystoke Castle," 380*
Land, Capt. E. S., on United States Naval Aviation, 88
Land Reclamation, Royal Edward Dock Extension, Avonmouth, 566*
— — Southampton Dock Extensions, 803
Lander, Dr. C. H., on the Utilisation of Solid and Liquid Fuels, 722. See 701
Landlord and Tenant Act, Effects of, 451
Lane, E. W., on River St. Lawrence Improvement, 62*, 114*, 125*. See 137
Lange, F. M. T., the Late, 511
Lapworth, Dr. H., on Floods and Waste-Weir Capacity, 788*. See 760
Lard Oil, Viscosity at High Pressures, 281
Lasche's Experiments, High-Speed Bearings (Review), 33
Lathes. See *Machine Tools*
Law. See *Legal; Labour; Patents*
Lead Alloys. See *Alloys* under *Metallurgy*
— Prices. See *Metal-Price Diagrams*
— Sheathed Cables, Automatic Plumber for Jointing, 254*
— — Cables, Cracking of, Investigations, 297, 299*, 334*
— Zinc-Copper Ores, Metallurgy of, 759, 787
Legal :
Condensing Water, Legal Position Regarding Supplies, 170
Electricity, Private Supply, Caerphilly Urban District Council *versus* Griffin, 19
— (Supply) Act, 1926, Effects of, 17, 737
Labour Legislation. See *Labour*
Landlord and Tenant Act, Effects of, 451
Naval History in the Law Courts (Review), 517
Legal—*continued.*
Patent Law. See *Patents*
Power Supply, Electric, Effect of Recent Legislation, 17
Railways, Goods Transport, Legal Position, 503
Rating, Basis of, Valuation and Depreciation in (Review), 693
— Industrial Premises and Plant, Assessment for, 258; Government Proposals, 775
Trade Unions and the Law (Review), 564
See also PARAGRAPH INDEX
Legislation. See *Legal; Labour; Patents*
Leicester Fire Brigade, Motor Ladder and Pump, 132*
Leipzig Fair, Technical Exhibits, 282*, 326*. See LETTER, 382
Leitz, E., Fardi Range Finder, 58*
Letters to the Editor, 14, 74, 142, 174, 227, 258, 299, 351, 382, 540, 614, 645, 711*, 738, 771. See LETTERS INDEX
Level-Luffing Roof Cranes, Avonmouth Docks, 567*, 591
Leyden, Koninklijke Nederlandsche Grofsmederij, Tests of Chain Links, 2*
Lifeboats, Ships, Vreugdenhil Listproof Davits, 505*. See 541
— — Welin-Maclachlan Davits for, S.S. " Duchess of Bedford," 675*
Lifting Bridges. See *Bridges*
Lifts, Electric, for Mails, Post Office Tube Railway, 312*
— Passenger and Goods, at Building Exhibition, 510
Light Alloys. See *Alloys* under *Metallurgy*
— and Electricity, Relationship, Modern Theories, 201. See 506
— Polarised, Stress Determination by. See *Optical*
— Quantum and Relativity Theories, 372
— Reflection from Ground, Photometer for Measuring, 779
— Treatment, Gas Appliances for, 770
— Ultra-Violet, Fading of Peacock Feathers in, 655. See 779
— — Violet, Fluorescence of Minerals in, 655
— — Violet, Transmission through Bottle Glass, 487
— Wave and Corpuscular Theories, 506. See 201
Lighters for Railway Wagons, Strength and Deflection of Hulls, 54
Lighthouses, Historical Exhibits, Institution of Civil Engineers Conversazione, 708
Lighting, Artificial Daylight, Production and Properties, 142
— of Buildings by Daylight, 401*, 716*
— Coast and Channel, Historical Exhibits, Institution of Civil Engineers Conversazione, 708
— Dock, Use of High-Pressure Gas, 809
— Effect in Typesetting, 504
— Electric, Domestic, Effect on Load Factor of Supply, 704, 724
— Fittings, Standard Specification for Translucent Glassware, 400
— Gas. See *Gas*
— Natural, of Picture Galleries, 716*
Lightning. See *Electric*
Lightships, Historical Exhibits, Institution of Civil Engineers Conversazione, 708
Limit Gauges. See *Gauges; Gauging*
Lindsay, C. C., the Late, 22
Liners. See *Steamers*
Links, Expansion, Locomotive Valve Gear, Grinding Machine for, 521*
Lintott, H. & E., Elevating Pugmill, 509*
Lion, Aero Engine, Schneider Trophy Race, 632*
Liptak Arches, Boiler Furnaces, Trenton Channel Power Station, 500*
Liquids, Crispations of, 644
— Fuel. See *Oil Fuel*. See also *Alcohol; Motor; Petrol*
— Measurement of Surface Tension, 212
— Oxygen. See *Ozygen*
— Production of Gas Bubbles in by Submerged Orifices, 30
— Viscosity of. See *Viscosity*
— Viscous, Flow through Pipes, 498*
Listproof Davits, Vreugdenhil, 505*. See 541
Literature, 33, 82, 141, 173, 286, 344, 370, 471, 517, 528, 563, 602, 692, 780. See LITERATURE INDEX
Litigation. See *Legal; Labour; Patents*
Liverpool Congress, Institute of Transport. See *Transport, Institute of*
— Mersey Docks, Management and Trades, 634
— Road-Traffic Requirements, 635
Ljungström-Howden Air Preheaters, Shanghai Power Station, 685
Lloyd's Statistics, Vessels under Construction, 48, 484
— — Vessels Launched, 148
— — Vessels Lost, 372
Load Factors, Electric Power Stations, 356, 450, 704, 724
— Tanks, Turbo-Generator Tests, Metropolitan Vickers Electrical Co., Ltd., 763*
Local Authorities. See *Municipal*
" Lochmonar," M.S., Stresses in Stranded Condition, 409, 427*
Locomotive Boiler with Nicholson Thermic Syphons, 347*
— — Special Steels for, 695
— — Water-Tube Firebox, Experimental Results, 103
— 4-8-4 Type, with Booster, Canadian National Railways (Canadian Locomotive Co., Ltd.), 347*, 473*
— Development of, Historical Exhibits, Institution of Civil Engineers Conversazione, 708
— Diesel-Engine, Gear and Electric Transmission, Comparative Trials on Russian Railways, 504
— — Engine, Recent Practice, 726, 751
— Driving-Axle Box, Floating-Bush Type, 473*. See 347*
— Electric Battery, Coal-Handling, Stourport Power Station, 12*
— — Battery, Post Office Tube Railway, 251*
Locomotive, Electric Camshaft Control Gear (English Electric Co., Ltd.), 155*. See 214*
— — 3,000-volt, Direct Current, South African Railways, 679*
— — 4-6-4 Type Express Passenger, Great Indian Peninsula Railway (Brown, Boveri & Co., Ltd.), 297*
— — Individual Axle Drive for, Brown-Boveri, 298*
— — Operating on Three Voltages, Sacramento Northern Railroad, 664
— Frames, Jig for Erecting, Crewe Works, 362*. See 359
— Industry, Position and Prospects, 294
— Parts, Grinding Machines for, 521*
— Petrol-Driven, for Shunting in Quarry (J. Fowler & Co. (Leeds), Ltd.), 8*
— Repairs, Processing System, Crewe Works, 364*. See 355, 359
— — Shops, Transverse or Longitudinal Arrangement, 355. See 358, 362*
— Road. See *Motor; Road; Tractor*
— Shunting, Oil-Engine-Driven (Berliner Maschinenbau A. G.), 285*
— Steam, Recent Practice, 726, 751
— — Turbine, Recent Practice, 751. See 726
— Tank and Tender Types, Comparisons of Running Properties, 138
— Testing Plant, Altoona, Experimental Results on Three-Cylinder Compound Engine, 103
— — Plants, Value of, 359
— Thermodynamic Cycle for, 103
— Three-Cylinder Compound, Baldwin Locomotive Works, Experimental Results, Discussion on, 103
— Use of High Steam Pressures, 103
— Valve Gear, Baker Type, 347*
— Works, Crewe, Reorganisation, 358, 362* See 355. See *Errata*, 414
— See also *Railways* in PARAGRAPH INDEX
Lockouts. See *Labour*
Lodge, Sir O., on the Revolution in Physics, 506
London Area, Telephone Developments, 170
— Charges for Electricity in, 20
— Charing Cross Bridge, Ministry of Transport Proposals, 513, 609. See LETTER, 738
— County Council Housing Schemes, 48
— District, Roads Improvements, Progress, 19
— Electricity Supply in, South East England Scheme, 230
— Floods, River Thames, from Tidal Wave, 48, 77, 294. See LETTER, 74
— and Home Counties Traffic Advisory Committee, Report, 19
— Midland & Scottish Railway, Reorganisation of Crewe Works, 358, 362*. See 355, 414; Use of Chromium-Steel Rails, 602, 617, 632; Co-Operation Scheme, 636
— Post Office Tube Railway for Mails, 92*, 153*, 214*, 250*, 309*. See LETTER, 299
London Power Co., Grove Road Power Station, Flue-Dust Collector, 223*
— Suburban Railways, Proposed Extensions, 19
— Terminal Acrodrome, Wireless Equipment, 190*
— Thames Bridges, Report of Royal Commission, 20
— Underground Railways. See *Underground*
— Water Supply, Slow-Sand Filters, Walton 788*. See 760
— — Supply System, 611, 787*. See 760
Longridge, M., the Late, 112*. See 109
Lopulco Short-Flame Pulverised-Fuel Burner, 432*
Loree, L. F., on Steamboats of Lake Champlain, 549
Lorentz, Prof. H. A., the Late, 175
Los Angeles Water Supply, Failure of St. Francis Dam, 419*, 452*, 547, 580, 644
Low-Temperature Carbonisation of Coal. See *Coal*
Lubricating Oils, Viscosity at High Pressures, 281
— — Viscosity at High Temperatures, 628
— — See also *Oils*
Lubrication, Cylindrical Bearings, Distribution and Thickness of Oil Film, 416
— Michell Thrust Bearings, Temperature Limits, 295
Lubricator, Michalk Force-Feed, 151*
Lundberg, Dr. H., on Electrical Prospecting for Ore, 697
Lutts, C. G., Tests of Chain Links, 2*
Lux Fire-Extinguishing Installation, Barking Power Station, 441*
Lydall, F., on South African Railway Electrification, 650*, 679*. See 402, 481

M.

MAC. See also *Mc*
Macfarlane, A., on Air Pre-Heating for Marine Boilers, 323. See LETTER, 351
Machine Shops. See *Works* and *Machine Tools*
— Testing. See *Testing Machine* and *Tests (Materials)*
Machine Tools :
Bending Machine for Angle Rings (W. Kennedy), 256
Boring and Drilling Machine, Horizontal (Karl Wetzel Maschinenfabrik), 282*
— Facing and Milling Machine, Horizontal, Metropolitan-Vickers Electrical Co., Ltd., 657*
— Machine, Jig, Metropolitan-Vickers Electrical Co., Ltd., 277*
— Milling and Drilling Machine, Vertical Combined, Metropolitan-Vickers Electrical Co., Ltd., 730*
— and Milling Machine, Horizontal (Collet & Engelhard), 283*
— Mills, Vertical, Metropolitan-Vickers Electrical Co., Ltd., 656*, 730*
Box-Nailing Machine (W. Fredenhagen), 283*
Cutter Guard for Milling Machines (A. Herbert, Ltd.), 255*
Cutting Tools, Hot Hardness and Cutting Properties, 51

Machine Tools—*continued.*

Cutting Tools, Research Committee, Report on Cutting Temperatures, Discussion, 51
— Machine for Machine-Tool Turnings (Magnet Werk), 284*
Dividing Head, Optical, for Machine Tools (C. Zeiss), 326
Drawing Brass Cartridge Cases, Investigations of Cracking, 304*, 312
Drilling and Boring Machine, Horizontal (Karl Wetzel Maschinenfabrik), 282*
— Machine for Condenser Tube Plates, Metropolitan-Vickers Electrical Co., Ltd., 657*
— — with Geared Automatic Feed (A. A. Jones and Shipman, Ltd.), 715*
— — Portable and Semi-Portable, Metropolitan-Vickers ElectricalCo.,Ltd.,657*
— — Radial, with Double Work Table, Metropolitan-Vickers Electrical Co., Ltd., 730*
— Milling and Boring Machine, Vertical Combined, Metropolitan-Vickers Electrical Co., Ltd., 730*
Drills, Pneumatic, for Concrete Breaking (Reavell & Co., Ltd.), 222*
Edging and Sawing Machine, Wood (J. Sagar & Co., Ltd.), 508*
Erecting-Shops, Crewe Locomotive Works, Reorganisation, 363*. See 355, 359, 414
— — Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 658*
Facing, Boring and Milling Machine, Horizontal, Metropolitan-Vickers Electrical Co., Ltd., 657*
Forging Press, 500-ton (Eumuco A.G.), 282*
Gauge Making and Maintenance, Metropolitan-Vickers Electrical Co., Ltd., 278*
Gear Cutting, Accuracy of Hob-Cut Helical Gears, 465*, 531*, 598*
— — Machines, Metropolitan - Vickers Electrical Co., Ltd., 656*
— Tooth Measuring Machine, Metropolitan-Vickers Electrical Co., Ltd., 280*
Grinding Machine for Axle Journals, Railway Rolling-Stock (Noble & Lund, Ltd.), 637*
— — Centreless (Herminghausen-Werke), 326
— — Duplex Chucking Type (Schuchardt & Schutte A.G.), 326
— — Internal, Electro-Hydraulic Motions (Wotan-Werke), 326
— — Laminations of Electrical Machinery, Metropolitan-Vickers Electrical Company, Ltd., 186*
— — at Leipzig Fair, 282*, 326
— — for Locomotive Parts (Beyer, Peacock & Co., Ltd.), 521*
— — Motor Car-Engine Cylinders (Harvey, Frost & Co., Ltd.), 174
— — Radial-Plano, for Dies, Metropolitan-Vickers Electrical Co., Ltd., 277*
— — for Rolls (Naxos Union), 282*
— — Shaft, Churchill, Metropolitan-Vickers Electrical Co., Ltd., 731*
— — Surface, Hydraulically - Operated Table (K. Jung), 326
Guard, Milling-Cutter, (A. Herbert, Ltd.), 255*
Hack-Saw Blades, Eclipse High-Speed Steel (J. Neill & Co., Ltd.), 639
— — for Sheet Materials, Enox (Fry's (London), Ltd.), 368*
Hammers, Pneumatic, for Concrete Breaking (Reavell & Co., Ltd.), 222*
— Steam Pile-Driving, Menck, 491*
Jig Boring Machine, Metropolitan-Vickers Electrical Co., Ltd., 277*
Lathe, 5¼-in. Centre Capstan (A. Herbert, Ltd.), 240*
— High-Speed (Schiess-Defries A.G.), 283*
— Motor-Car Axle (Sir W. G. Armstrong, Whitworth & Co., Ltd.), 160*
— Ornamental, Free-Curve Attachment for, 584*
— Railway Wheel, Semi-Automatic (W. Hegenscheidt), 283*
— for Turbine Rotors, Metropolitan-Vickers Electrical Co., Ltd., 731*
— Turret, All-Geared Headstock (M. Hasse A.G.), 282*
Limit Gauging. See *Gauging*
Machine Shops, Crewe Locomotive Works, Reorganisation, 362*. See 359, 414
— — Management. See *Works Management*
— — Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 656*, 729*. See 815*
— Tools, German, at British Exhibitions, 382
— — Importers' Association, Policy, 779
— — Industry, Position and Prospects, 248
— — at Leipzig Fair, 282*. See LETTER, 382
— — Trades Association, Annual Dinner, 387
— — Turnings, Cutting Machine for (Magnet Werk), 284*
— Work, Microphotographs of Surfaces, 373*
— — Tolerances in. See *Gauging*
Machined Parts, Steel Bars for, Standard Specification, 185
— Surfaces, Irregularities of, 373*
Machining Operations, Turbine Blading, Metropolitan-Vickers Electrical Co., Ltd., 188*
Milling and Boring Machine, Horizontal (Collet & Engelhard), 283*
— Chain Wheels for P.I.V. Variable-Speed Gear, 256*
— Cutter Guard (A. Herbert, Ltd.), 255*
— Drilling and Boring Machine, Vertical Combined, Metropolitan-Vickers Electrical Co., Ltd., 730*
— Facing and Boring Machine, Horizontal, Metropolitan-Vickers Electrical Co., Ltd., 657*

Machine Tools—*continued*

Moulding and Planing Machine, Five-Cutter, for Wood (T. Robinson & Son, Ltd.), 476*
— — Machine for Hardwoods, Six-Roller High-Speed (T. Robinson & Son, Ltd.) 130*
— — Wood, High-Speed (J. Pickles & Son (Engineers), Ltd.), 477*
Nailing Machine, Box (W. Fredenhagen), 283*
Nut-Making Machine (G. Wuttig), 282*
Ornamental Lathe, Free-Curve Attachment for, 584*
Planing Machines, Electrical Drive, Metropolitan-Vickers Electrical Co., Ltd., 730
— — for Heavy Work, Metropolitan-Vickers Electrical Co., Ltd., 657*, 729*
— and Moulding Machine, Five-Cutter, for Wood (T. Robinson & Son, Ltd.) 476*
— — Machine for Hardwoods, Six-Roller High-Speed (T. Robinson & Son, Ltd.), 130*
— — Machine, Wood, High-Speed (J. Pickles & Son (Engineers) Ltd), 477*
Pneumatic Drills. See *Drills* (above)
— Hammers. See *Hammers* (above)
Press, 200-ton, for Finishing Laminated Springs (H. Pels), 283*
— Forging, 500-ton (Eumuco A.G.), 282*
— Power, Adjustable-Stroke Type (Oldfield & Schofield, Ltd.), 224*
— — with Rising Tables, for Deep Drawing (Hordern, Mason & Edwards, Ltd.), 396*
— Screw, 125-ton Percussion Type, for Hot Pressing (J. Hands & Sons, Ltd.), 220*
Punching Plant, Laminations, Electrical Machinery, Metropolitan-Vickers Electrical Co. Ltd., 186*
Railway-Wheel Lathe, Semi-Automatic (W. Hegenscheidt), 283*
Reamers, Standard Tolerances for Diameters, 729
Recessing Machine, Double Spindle, for Stair Stringa (J. Sagar & Co., Ltd.), 508*
Riveting Machine, High-Speed, for Cold Rivets (M. Hasse, A.G.), 282*
Roll-Grinding Machine (Naxos Union), 282*
Sanding Machine, Belt-Type (Dominion Machinery Co., Ltd.), 509*
— — Three-Drum (J. Pickles & Son (Engineers), Ltd.), 477*
Saw Bench, 36-in. Roller Feed (Wadkin & Co.), 203*
— Cross-Cut, Automatic Motor-Driven (Wadkin & Co.), 203*
— — Cut, Portable Power-Driven, for Logs (A. Ransome & Co., Ltd.), 179*
— Wood, at Leipzig Fair, 326
— See also *Hack Saws* (above)
Sawing and Edging Machine, Wood (J. Sagar & Co., Ltd.) 508*
Shearing Machines, Plate-Roiling Mills, Appleby Iron Co., Ltd., 588
Springs, Laminated, 200-ton Press for Finishing (H. Pels), 283*
Stair Strings, Recessing Machine for (J. Sagar & Co., Ltd.), 508*
Stamping Plant, Laminations, Electrical Machinery, Metropolitan-Vickers Electrical Co., Ltd., 186*
Swarf, Cutting Machine for, (Magnet Werk), 284*
Tools, Cutting, Hot Hardness and Cutting Properties, 51
— — Research Committee, Report on Cutting Temperatures, Discussion, 51
— Room, Metropolitan-Vickers Electrical Co., Ltd., 277*
Turning and Boring Mills. See *Boring* (above)
— Ornamental, Free-Curve Attachment for, 581*
Turnings, Machine-Tool, Cutting Machine for (Magnet Werk), 284*
Turret Lathes. See *Lathes* (above).
Wheel Lathe, Semi-Automatic (W. Hegenscheidt), 283*
Wire-Forming Machine (C. Semper), 282*
Woodworking Machinery Importers' Association, Policy, 779
— — at Leipzig Fair, 326
— — Moulding and Planing Machine, Five-Cutter (T. Robinson & Son, Ltd.), 476*
— — Planing and Moulding Machine, High-Speed (J. Pickles & Son (Engineers), Ltd.), 477*
— — Planing and Moulding Machine, Six-Roller High-Speed (T. Robinson & Son, Ltd.), 130*
— — Portable Cross-Cut Saw for Logs (A. Ransome & Co., Ltd.) 179*
— — Recessing Machine, Double-Spindle, for Stair Strings (J. Sagar & Co., Ltd.), 508*
— — Sanding Machine, Belt-Type (Dominion Machinery Co., Ltd.), 509*
— — Sanding Machine, Three Drum (J. Pickles & Son (Engineers), Ltd.), 477*
— — Saw, Bench, 36-in. Roller-Feed (Wadkin & Co.), 203*
— — Saw, Cross-Cut, Automatic, Motor Driven (Wadkin & Co.), 203*
— — Sawing and Edging Machine (J. Sagar & Co., Ltd.), 508*
See also PARAGRAPH INDEX
Machine Work. See *Machine Tools*
Machinery, Chinese Imports, 174
— Electrical, British and Foreign, Comparisons of Efficiency, 172
— — Fundamentals of Design (Review), 564
— — Manufacture and Testing. See *Metropolitan Vickers Electrical Co., Ltd.*
— — Principles of Design (Review), 141
— Imports and Exports, Statistics, 21, 61, 91, 139, 171, 248, 294, 324, 358
Machinery (Machine Tool and Woodworking) Importers' Association, Policy, 779
— Use in Agriculture, 811
— Vibration of (Review), 34
Maclaurin Smokeless-Fuel Plant, Dalmarnock Gas Works, 128*
Madden, H. D., on the Gas Industry, 743
Magdeburger, E. C., on Diesel Engines for Naval Service, 89
Magnesium Alloys. See *Alloys* under *Metallurgy*
Magnets, Permanent, Testing Apparatus, 101
— Steel, Tungsten, Influence of Silicon, 554*, 600, 632
Magnet Werk, Cutting Machine for Machine-Tool Turnings, 284*; Magnetic Separator for Liquids, 284*
Magnetic Detector, Cracks in Railway Axles, Acton Works, 646
— Fields, Intense, Investigations, 219, 338
— Plate-Handling Machines, Rolling-Mill Plant, 553*
— Separator for Liquids (Magnet Werk), 284*
— — Recovery of Non-Ferrous Scrap from Turnings, 122*
Magneto Generators, High-Tension Current Supply to Wireless Apparatus, 224*
— Motor-Car Engine, Flexible Coupling for Driving, 52*
Mails, Underground Electric Railway for, London, 92*, 153*, 214*, 250*, 309*. See LETTER, 299
Mains, Electric. See *Cables* under *Electric*
Malleable-Iron Castings, Standard Specifications, 276
Management of Works. See *Works Management*
Manchester Association of Engineers, Annual Dinner, 113; Joint Meeting with Institution of Mechanical Engineers (North Western Branch), Discussion on Cutting Temperatures, by E. G. Herbert, 51
— Main Drainage, Rainfall and Run-off Ground, 760, 789*
— Municipal College of Technology, Evening Courses, 638
— Ship Canal, Traffic Statistics, 429
— Steam Users' Association, Report on Boiler Failures, 386
— Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd. See *Metropolitan-Vickers*
Manganese, Influence on Nickel Steel, 579, 632
Mannesmann Process, Rolling Steel Tubes, Investigations, 269*
Manometer, Bubble, for Precision Measurements (Negretti & Zambra), 102*
Manufactured Goods, Standardisation and Simplified Practice, 324
Manufacturing Premises and Plant, Assessment for Rating, 258
— — and Plant, Proposed Rates Reduction, 775
Manures, Artificial, German Synthetic-Ammonia Industry, 536
Marconi's Wireless Telegraph Co., Ltd., Wireless Equipment, Croydon Aerodrome, 190*
Marine Auxiliary Machinery, Geared Turbo-Generators, H.M.S. "Rodney," 375*
— — Machinery, M.S. "Greystoke Castle," 380*
— — Machinery, M.S. "Zealandic," 526
— — Machinery, S.S. "Duchess of Bedford," 675*
— Boilers. See *Boilers*
— Engineering Industry, Position and Prospects, 357
— — Lloyd's Statistics, 484
— Engineers, Consulting, and Ship Surveyors, Society of. See *Consulting Marine Engineers*
— — Institute of, Annual Report, 326
— — and Naval Architects, American Society of. See *Naval Architects*
— Engines. See *Engines; Turbines; Marine Propulsion*
— Propulsion, Boilers, Advantages of Air Pre-Heating, 323. See LETTER, 351
— — Boilers, Water-Tube and Cylindrical, Comparisons, 378, 430*. See 389
— — Boilers, Yarrow High-Pressure Water-Tube and Cylindrical, S.S. "Duchess of Bedford," 675*. See 711
— — Diesel Engines, Advantages of Pre-Heating Air, 40
— — Diesel Engines, Comparisons of Still and Doxford Types, 39. See 47
— — Diesel Engines, Comparisons of Two-Stroke and Four-Stroke Cycles, 39, 47
— — Diesel Engines, Design and Construction (Review), 173
— — Diesel Engines, Effects of Turbulence, 40
— — Diesel Engines Experimental Investigations Admiralty Engineering Laboratory, 407, 425*, 462*
— — Diesel Engine, North Eastern-Werkspoor, M.S. "Greystoke Castle," 380
— — Diesel Engines, Present-Position, 39, 47
— — Diesel Engines, Progress in Adoption, 701, 721
— — Diesel Engines, Schelde-Sulzer Type, for M.S. "Sibajak," 71
— — Diesel Engines, 7,000-h.p. Sulzer, 412*
— — Diesel Engines, Supercharging in, 41
— — Diesel Engines, Volumetric Efficiency of, 40
— — Diesel Engines, Wallsend-Sulzer Type, M.S. "Zealandic," 525*
— — Fuel for, Comparisons of Coal and Oil, 378*, 389, 430*
— — Geared Turbines, S.S. "Duchess of Bedford," 675
— — High-Pressure Steam for, 701, 721
— — Machinery under Construction, Lloyd's Statistics, 484
— — Mechanical Stokers, Comparisons with Other Systems, 378, 430*, See 389
— — Michell Thrust Bearings, Temperature Limits, 295
— — Oil Engines, Design of Small Vessels (Review), 173
— — Oil Fuel for. See *Oil Fuel*
— — Propellers, Conditions Producing Cavitation, 439
— — Propellers, Model, in Air and Water, Comparisons, 409
— — Propellers, Model Experiments, Effect of Fins in Propeller Aperture, 438, 461*
— — Propellers, Vortex Theory, 439
— — Pulverised Fuel, Comparisons with other Systems, 379, 430*. See 389
Marine Propulsion, Pulverised Fuel, Short-Flame Burners, 431*
— — Steamers, Loss of Speed in Service, 440,
— — Steamers, Double-Ended Screw, for Sydney Harbour, 397*, 408
— — Turbine, Exhaust-Steam, Bauer-Wach System, S.S. "Britannia," 206
— — Turbines, High Pressure, S.S. "King George V," Results, 379. See 390
— — Vibration of Ships, Causes, 199. See LETTER, 227
— — See also *Engines; Turbines; Propellers;* and PARAGRAPH INDEX
— Salvage. See *Salvage*
— Structures, Timber, San Francisco Bay, Destruction by Boring Organisms, 757*
— Turbines. See *Turbines. Steam; Marine Propulsion*
Markets. See *Trade* and PARAGRAPH INDEX
Markmann, P. I., on Stress Distribution in Ferro-Concrete Columns, 515
Marshall, Sons & Co., Ltd., 60-h.p. Two-Cylinder Vertical Two-Stroke Oil Engine, 204*
Maschinenfabrik Augsburg-Nurnberg A.-G., Diesel Engine for Motor Vehicles, 328*
Mason, Dr. M., on Geophysical Exploration for Ores, 697
Materials, Strength of (Review), 471
— — See also *Stress* and *Tests* (*Materials*)
Mathematics and the Development of Engineering, 710. See 807
— Dimensional Theory, Application to Steam-Nozzle Flow, 80
— Value in Engineering, 807. See 710
Mather & Platt, Ltd., Cask-Washing Machine, 195*
Matsuda, Dr. T., on the Heat Treatment of Brass, Bronze and Aluminium Bronze, 492
Matter, Transformation of, 315*, 360*, 387*, 422*
May Lecture, Institute of Metals, on Chemical Properties of Crystals, 613
McAlister, F., on the Relative Strength of Cargo Vessels, 408
McAlpine, Sir R. & Sons, Takoradi Harbour Works, 455*
McEntee, Capt. W., on Model Tests of Propellers, 54
McLellan, J., on Progress in Hydro-Electric Installations, 786. See 759
Mc. See also *Mac*
Measurement, Base-Line, Catenary and Mechanical Methods, 559*
Measuring Machine, Gear-Tooth, Metropolitan-Vickers Electrical Co., Ltd., 280*
— Tapes, Tests of, United States Bureau of Standards, 623. See *Erratum*, 805
Mechanical Engineers, American Society of, Properties of Steam Research, Progress Reports, 202; Viscosity of Lubricating Oils, by M. D. Horsey and H. Shore, 281; Engineering Index, 700; Use of Pulverised Fuel in Basic Open-Hearth Furnaces, by E. L. Herndon, 808.

Mechanical Engineers, Institution of:

London Meetings, Winter Session;

Gray Lecture on the Marine Oil Engine, by Prof. C. J. Hawkes, 39. See 47
The late Mr. M. Longridge, 109. See 112*
Election of Officers, &c., 109, 233
Fifth Report of Steam Nozzle Research Committee, 116*, 147*. See 107, 109*, 207*. See LETTER, 174
Annual Report, 233
Presentation of Prizes, 233
Waste Heat Recovery, by Major W. Gregson, 241*, 272. See 233, 264
Unveiling of George Stephenson Memorial, 290, 358
Reorganisation of Crewe Locomotive Works, by Capt. H. P. M. Beames, 362*. See 355, 358. See *Errata* 414
Benevolent Fund Meeting, 515
The Late Mr. H. Davey, 515. See 485*
Retirement of Hon. Treasurer, 515
Causes of Failure of Wrought-Iron Chain and Cable by Dr. H. J. Gough and A. J. Murphy, 618*, 652*. See 515, 741
Third Report of Wire Ropes Research Committee, by Dr. W. A. Scoble, 522* See 515*, 543

North Western Branch;

Joint Meeting with Manchester Association of Engineers, Discussion on Cutting Temperaures, by E. G. Herbert. 51
Some Experimental Results on a Three-Cylinder Compound Locomotive, by L. H. Fry, Discussion on, 103
Discussion on Fifth Report of Steam Nozzles Research Committee, 207*. See 107, 109*, 116*, 147*, 174
Waste Heat Recovery, by Major W. Gregson. Discussion on, 264. See 233, 241*, 272

Summer Meeting, Southampton;

Inaugural Proceedings, 808
Port of Southampton, by F. E. Wentworth-Shields, 800* See 809

Mechanical Flight. See *Aeronautics*
— Lubricator. See *Lubricator*
— Stokers. See *Stokers*
— Traction on Roads. See *Roads; Motor Cars; Tractors*
— Vibrations, Treatise on (Review), 34
— Warfare Board, Appointment, 357
Mechanics, Moments of Inertia, Rotors of Electrical Machinery, Experimental Determinations, 213*. See LETTER, 614
Meek, J. B. L., on Sewerage, with Special Reference to Run Off, 789*. See 760
Menck Steam Pile-Driving Hammer, 491*
Merchant Ships. See *Ships; Steamers*
— Shipbuilding. See *Shipbuilding*
Mercury-Arc Rectifiers, Principles and Circuits (Review), 173
— Jets, Impact with Steel and Glass, 572
— Prices. See *Metal-Price Diagrams*
Merryweather & Sons, Ltd., Motor Turntable Ladder and Pump, Leicester Fire Brigade, 132*

Mersey Docks, Management and Trades, 634
Merz & McLellan, Electric Locomotive, Great Indian Peninsula Railway, 297*
Mesopotamia, Railways, Report on, 776
— Telegraph System, 209*
Metallisation, Ltd., Steel Trucks, 256
Metallography. See *Metals; Metallurgy; Micrographs*
Metallurgical and Mining Engineers, American Institute of. See *Mining and Metallurgical Engineers*

Metallurgy :

Alloys, Aluminium-Bronze, Effect of, Quenching and Tempering, 492*
— — Dilatometric Investigations, 297, 337*
— — with Silicon and Iron, Constitution of, 179*, 210*
— — Thermal and Electrical Conductivity 301*. See 312
— Chemical Properties of Crystals, 613
— Copper. See *Brass; Bronze; Gunmetal, &c.*
— Corrosion in Sea Water, 314
— Development of the Equilibrium Diagram, 296
— Eutectic, Ball Hardness, 313
— Investigations of, Metropolitan-Vickers Electrical Co., Ltd., 123*
— Lead, Pipe Manufacture, Development of, 685
— Non-Ferrous, Hot Forging of, 313, 331*
— — Ferrous, Work of British Non-Ferrous Metals, Research Association, 685
— White Bearing Metals, Effect of Over-Heating, 123*
— Zirconium, Properties of, 315
Blast Furnaces. See *Furnaces*
Brass. See *Brass*
Bronze, See *Bronze*
Cast Iron. See *Cast Iron*
Chromium Ore, World Supplies of, 440
Coke Ovens. See *Coke Ovens*
Corrosion of Metals. See *Corrosion*
Dilatometric Investigations, Aluminium and Aluminium Alloys, 297, 337*
Electrolytic Iron, Inception and Development, 339*
Equilibrium Diagram, Development of, 296
Foundry. See *Foundry; Moulding*
Furnaces, Electric. See *Furnaces*
— Metallurgical. See *Furnaces*
Heat Treatment, Annealing Chain Links, Effect on Brittleness, 2*, 516, 618*, 652*, 741
— — Brass, Bronze and Aluminium Bronze, Effect of Quenching and Tempering, 492*
— — Chromium-Steel Rails, 617. See 602, 632
— — Effect on Standard Silver, 314
— — Effect on Tungsten Magnet Steel, 555*
— — Over-Strained Steel, Rapid Normalising by Electric Current, 632, 682*
— — and Properties of Cutting Tools, 51
— — of Steel, Treatise on (Review), 517
— — of Wrought-Iron Chains and Cables, 2*, 516, 618*, 652*. See 741
Iron, Electrolytic, Inception and Development, 339*
— Ore. See *Ore*
— Sponge, Production of, Report, 361
Metallurgical Inventions and the Progress of Engineering, 755
Metallurgy of Lead-Zinc-Copper-Ores, 759, 787
Metals, Grain Growth by Diffusion, 696
— Tests of. See *Tests (Materials)*
Non-Ferrous Metals Research Association, British, Report, 685
Pulverised Coal, Use in Metallurgy. See *Pulverised Coal*
Pyrometers. See *Pyrometers*
Refractories. See *Refractory Materials*
Rolling Mills. See *Rolling Mills*
Sponge Iron, Production of, Report, 361
Steel Furnaces. See *Furnaces*
—Making Plant, Crewe Locomotive Works, 365*
— Manufacture, Basic Open-Hearth Process, Development, 547, 808
— — Energy Losses in Arc Furnaces, 150
— — Open-Hearth Plant, Appleby Iron Co., Ltd., 551*, 586
— — Progress in, and the Development of Engineering, 755
— — Supplies of Chromium, 440
— — Use of Pulverised Fuel in Open-Hearth Furnaces, 808
Welding. See *Welding*
See also *Iron and Steel Institute; Metals, Institute of; Metallography; Micrographs; Foundry;* and PARAGRAPH INDEX
Metallurgy and Mining, Institution of. See *Mining*
Metals, Anti-Friction. See *Alloys* under *Metallurgy*
— Chemical Properties of Crystals, 613
— Cold-Working of, Density Changes, 313
— Corrosion of. See *Corrosion*
— Fatigue of. See *Alternating Stress* under *Tests (Materials)*
— Gases in, Study by High-Vacuum Induction Furnace, 696
— Grain Growth by Diffusion, 696
— Industries, Report of Committee on Industry and Trade, 576

Metals, Institute of :

Standard Corrosion Tests, by Dr. G. D. Bengough, 80
May Lecture on the Chemical Properties of Crystals, by Prof. C. H. Desch, 613
Autumn Meeting, Derby;
Constitution of Alloys of Aluminium with Silicon and Iron, by Dr. A. G. C. Gwyer and H. W. L. Phillips, 179*, 210*

Metals, Institute of—*continued.*

Spring Meeting, London;
Hon. Treasurer's Report, 296
Presidential Address, by Dr. W. Rosenhain, on the Equilibrium Diagram, 296
Report of Council, 296
Reports of Discussions, 297, 312
Annual Dinner, 315
Thermal and Electric Conductivity of Some Aluminium Alloys and Bronzes, by Dr. E. Griffiths and F. H. Schofield, 301*. See 312
Season Cracking of Small Arms Cartridge Cases during Manufacture, by F. S. Grimston, 304*. See 312
Ball Hardness and the Cold Working of Soft Metals and Eutectics, by F. Hargreaves, 313
Behaviour of Metals and Alloys during Hot Forging, by Dr. W. L. Kent, 331*. See 313
Historical Note on Density Changes Caused by the Cold Working of Metals, by H. O'Neill, 313
Effect of Quenching and Tempering on the Mechanical Properties of Standard Silver, by Dr. A. L. Norbury, 314
Relative Corrodibilities of Ferrous and Non-Ferrous Metals and Alloys, by Dr. J. N. Friend, 314
Alloys of Zirconium, I, by Dr. T. E. Allibone and C. Sykes, 315
Quenching and Tempering of Brass, Bronze and Aluminium Bronze, by Dr. T. Matsuda, 492*
Deterioration of Lead Cable Sheathing by Cracking and its Prevention, by S. Beckinsale and H. Waterhouse, 299*, 334*. See 297
Dilatometric Study of Light Metals, by Dr. H. Haas, 337*. See 297
Influence of Dissolved Gases on the Soundness of 70 : 30 Brass Ingots, by G. L. Bailey, 366*. See 313
Metal Mixer, Appleby Iron Co.'s Works, 552*, 586
— Molten, Surface Tension of, 212
— Non-Ferrous and Alloys, Hot Forging of, 313, 331*
— — British Research Association, Report, 685
— — Corrosion in Sea Water, 314
— Price Diagrams, 24*, 144*, 268*, 424*, 550*, 714*
— Scrap, Contamination of, 696
— Single Crystals, Investigations of Fatigue Phenomena, 232, 264. See 200
— Soft, Cold-Worked, Ball Hardness of, 313
— Structure of. See *Metallography; Micrographs*
— Welding. See *Welding*
— See also *Metallography; Metallurgy; Micrographs*

Meteorological Society, Royal :

Symons Memorial Lecture on Sun's Cycle of Activity, by H. W. Newton, 455
Some Alpine Cloud Forms, by C. K. M. Douglas, 540
Statistical Analysis of the Daily Observations of the Maximum and Minimum Thermometers at Rothamsted, by T. N. Hoblyn, 540
Strong Wind of Small Gustiness, by N. K. Johnson, 540
Meteorology, Alpine Cloud Forms, 540
— Thermometer, Maximum and Minimum, Analysis of Observations, 540
— Wind of Small Gustiness, 540
Meter, Average-Recording, Electric Power Supply, 393*
— Electric, Induction Type (Everett, Edgcumbe & Co., Ltd.), 69*; (Nalder Brothers & Thompson, Ltd.), 69
— — Manufacture and Testing, Metropolitan-Vickers Electrical Co., Ltd., 815*
— See also *Electric*
Methane Explosions. See *Colliery Explosions*
Metropolitan Fuel Co., Ltd., Surface Combustion Apparatus, 221*
Metropolitan-Vickers Electrical Co., Ltd., Trafford Park Works, 64*, 122*, 186*, 277*, 403*, 656*, 729*, 761*, 815*; Exhibits at British Industries Fair, 221*, 224*
— Water Board, London Water Supply, 611, 787*. See 760; Slow Sand Filters Walton, 788*. See 760
— See also *London*
Micanite Insulation, Manufacture, Metropolitan-Vickers Co., Ltd., 403*
— and Insulators, Ltd., Dust-Separating Fan for, 428*
Michalk Force-Feed Lubricator, 151*
Michell Crankless Gas Engine (National Gas Engine Co., Ltd.), 220*
— Thrust Bearing for Rotary Variable-Delivery Pump, 288*
— — Bearings, Temperature Limits, 205
Micrometer, Direct-Reading, for Quartz Fibres, 655*
Microphotographs, Aluminium Alloys with Silicon and Iron, 180*, 210*, 211*
— Brass Ingots, Influence of Dissolved Gases, 367*
— Insulating Materials, 620*, 621*
— Lead Sheathing, Electric Cables, Investigations of Cracking, 300*, 335*
— Steel, Electrical Normalising, 684*
— Surfaces of Machine Work, 373*
— Tungsten Magnet Steel, Influence of Silicon, 554*
— White Metal, Effect of Overheating, 123*
Microscopes and Accessories, Physical and Optical Societies' Exhibition, 103
Microscopic Investigations, Insulating Materials, 620*
Microscopy of Drinking Water (Review), 780
Microstructure of Metals. See *Metallography; Micrographs*
Midi Railway, Electrification of, 200
Mill, Paint, Single-Roller Type (S. Smith & Blyth, Ltd.), 475*
— Rolling. See *Rolling Mills*
Milling Machines and Cutters. See *Machine Tools*
Milwaukee, Lakeside Power Station, Operating Experiences, High-Pressure Steam, 25*, 55*
Minerals, Fluorescence in Ultra-Violet Light, 655
— Oils. See *Oils*
— Prospecting for, Electrical Method, 697; Use of Eötvös Torsion Balance, 219, 696
— Stratified, Working of (Review), 346
— See also *Coal; Mining; Ores;* and PARAGRAPH INDEX
Mines, Carbon Monoxide in, Estimation by Iodine Pentoxide, 507
— Chilean, Liquid Oxygen for Blasting, 818
— Coal. See *Collieries*
— Morro Velho, Mining Methods, 379
— Safety in, Research Board, Report on Wire Ropes, 28, 543. See LETTER, 645; Reports on Pressure Produced by Blowing Fuses and by Arcing in Closed Vessels, 715
— Sampling Atmospheric Dust in, Impinger-Plate Method, 290
— Shafts, Vertical, Sinking of (Review), 528
— United States Bureau of. See *United States*
— Winding. See *Winding*
— Wire Ropes for, Federation of Manufacturers, 645
— See also *Coal; Collieries; Mining; Ores; Winding;* and PARAGRAPH INDEX
Mining, Coal, Explosives for, Investigations at Buxton Experimental Station, 715
— Coal and other Stratified Minerals (Review), 346
— Engineers, Institution of, Coal Mining Explosives, by Dr. W. Payman, 715
— at Great Depths, Problems Involved, 759, 787
— Industries, Operating Problems, 778
— Ironstone, Appleby Iron Co., Ltd., 584*. See 551*, 578
— and Metallurgical Engineers, American Institute of, Steel for Aircraft Construction, by E. A. Richardson, 695; Types of Steel Used by Railroads Past and Present, by R. Job, 695; Manufacture of Some Foreign Rails, by C. W. Gennet, 696; Backed-Up Mills for Continuous Rolling, by L. Jones, 696; Improvements in Blast-Furnace Construction, by J. P. Dovel, 696; Grain Growth in Metals Caused by Diffusion, by F. C. Kelley, 696; Contamination of Metal Scrap: its Effect on the Value, and Suggested Means of Control, by C. O. Thieme, 696; Application of High-Vacuum Induction Furnace to the Study of Gases in Metals, by P. H. Brace and N. A. Ziegler, 696; Eötvös Torsion-Balance Method of Mapping Geological Structure, by D. C. Barton, 696; Cartographic Correction for the Eötvös Torsion Balance, by C. A. Heiland, 697; Computation of Eötvös Gravity Effects, by E. Lancaster-Jones, 697; Gravity Surveying in Great Britain, by Capt. H. Shaw, 697; Experiments with Eötvös Torsion Balance in the Tri-State Zinc and Lead District, by P. W. George, 697; Geophysical Exploration for Ores, by Dr. M. Mason, 697; Recent Results in Electrical Prospecting for Ore, by Dr. H. Lundberg, 697; Earth-Resistivity Measurements in the Lake Superior Copper Country, by W. O. Hotchkiss, W. J. Rowney and J. Fisher, 697; Working Methods of Practical Geophysics, by H. Haalck, 697; Ten Years' Application of Compressed Air at Hamilton Corners, by Prof. C. R. Fettke, 818; Oil Production by Flooding, by P. D. Torrey, 818; Screened Radiated Heat for Refining and Cracking, by A. E. Nash, 818; Acid-Sludge Problem in Oil Refining, by J. R. Rather, 818; Liquid-Oxygen Blasting in Chile, by H. C. Schultz and F. K. M. Hunter, 818; Gas Sorption in Flotation, by A. S. Adams, 818; Sintering of Floated Concentrates, by A. S. Dwight, 818; Cleaning Bituminous Coal, by J. R. Campbell, 818; Classification of Coal by Hindered Settling, by B. M. Bird and H. F. Yancy, 818; Cleaning Blast-Furnace Gas, by A. J. Boynton, 819.
— and Metallurgy, Institution of, Annual Dinner, 577
— Methods, Morro Velho Mine, 379
— See also PARAGRAPH INDEX
Ministry of Transport. See *Transport*
Mitchell Conveyor and Transporter Co., Ltd., Coal-Handling Plant, Stourport Power Station, 11*
Mitchell, E. H., on Double-Ended Screw Vessels, 397*. See 408
Mitchell, H. H. G., on Harbour Breakwaters, 749. See 725
Mixer, Metal, Appleby Iron Co.'s Works, 552*, 586
Mixing, Feeding and Proportioning Machine, Clay for Brickmaking, 510
— Machines, Concrete. See *Concrete*
— Valve, Water, Sylphon, Automatic Temperature Control, Crosby, 276*
M.L. Magneto Syndicate, Ltd., Testing Permanent Magnets, 101; Electric Generators for Wireless Apparatus, 224*
Mobiloil, Viscosity at High Pressures, 281
Models, Celluloid, Arch Bridges, Stress Investigation, 810*. See 709
— Experiments, Propellers in Air and Water, 409
— — Ship Propulsion, Effect of Fins in Propeller Aperture, 438, 461*
— Niagara Falls, Preservation Proposals, 418
— Rubber, Investigation of Stresses in Dams by, Wilson and Gore's Experiments, 709
— Sydney Harbour Bridge Members, Tests of, 697*
— Tests, Adjustable-Blade Propellers, 54
Moisture, Atmospheric, Electrical Measurement, 487
Molten Metals, Surface Tension of, 212
"Moltke," Ex-German Battle Cruiser, Salvage Operations, 737*
Moments of Inertia, Rotors of Electrical Machinery, Experimental Determination, 213*. See LETTER, 614
Moncrieff, Col. J. M., on Theories of Earth Pressure, 674
Mond, Sir A., on Industrial Research, 643
Monoplane. See *Aeronautics*
"Montclare," S.S., Explosion of Feed-Water Heater, 518
Montigny-les-Metz Workshops, Use of Liquid Oxygen, 694*
Montreal Harbour and the Improvement of the St. Lawrence, 127. See 62*, 114*, 137
Morgan, E. L., the Late, 73
Morgan, Prof, G. T., on Low-Temperature Tar, 611
Morocco, Economic and Commercial Conditions, Report, 130
Morriston Gas Works, Swansea Gas Light Co., 743
Morro Velho Mine, Mining Methods, 379
Mortars, Cement. See *Cement*

Motor Car Details :

Axles, Lathe for Turning, 160*
Engines. See *Engines, Petrol, Motor Car*
Gear, Change-Speed, Rieseler Hydro-Mechanical, 444*
Motor Car Engineers. See *Automobile Engineers*
— — Engines. See *Engines, Petrol*
— — Fuels. See *Motor Fuel*
— — Generators and Magnetos, Flexible Coupling for, 52*
— — Industry, Position and Prospects, 91
— — Rieseler Hydro-Mechanical Change-Speed Gear, 444*
— — Taxation, Statistics, 172
— — See also *Motor Cycles* and PARAGRAPH INDEX
— Converters, Peebles-LaCour, Automatic Substations, Brighton, 649*
— Cycle Industry, Position and Prospects, 130
— Electric, Alternating Current, with Ball and Roller Bearings (Metropolitan-Vickers Electrical Co., Ltd.), 224*
— — Alternating Current, Contactor Type Star-Delta Starter (General Electric Co., Ltd.), 205*
— — and Control Gear, Locomotive for Great Indian Peninsula Railway, 297*
— — Control Gear, Manufacture, Metropolitan-Vickers Electrical Co., Ltd., 815*
— — Direct Current, Starting and Control Panel (Metropolitan-Vickers Electrical Co., Ltd.), 221
— — Direct-Current (Lancashire Dynamo & Motor Co., Ltd.), 253*
— — Direct-Current Traction Type, Control Equipment (General Electric Co., Ltd.), 204*
— — with Epicyclic Reduction Gearing, 252*
— — Flange Type, for Machine Tool Motions, 326
— — Fundamentals of Design (Review), 564
— — High-Torque, Squirrel-Cage Type (General Electric Co., Ltd.), 204*
— — Hot-Wire Type, for Recording Potentiometer, 49*
— — Locomotive, Operating on Three Voltages, 664
— — London Electric Railways, Repairs at Acton Works, 647
— — Manufacture and Testing. See *Metropolitan-Vickers Electrical Co., Ltd.*
— — Moments of Inertia of Rotors, Experimental Determination, 213*. See LETTER, 614
— — Principles of Design (Review), 141
— — Standard Specification for Field Rheostats, 306
— — Starting and Control Gear, Boiler-House Auxiliaries (Brookhirst Switchgear, Ltd.), 85* 145*
— — Synchronous, for Averaging Recorder, 393*
— — Synchronous, for Warren Frequency Meter, 69*
— — Three-Phase (Allgemeine Elektrizitäts Gesellschaft), 329*
— — Traction, High-Tension Direct-Current, Characteristic Curves, 680*
— Fuels, Action of Anti-Knock Dopes, 673. See *Errata*, 713
— — Alcohol Production from Vegetable Wastes, 78
— — Production from Coal, 671. See LETTER, 738
— — Production of Petrol from Natural Gas, 63
— Generator for Arc Welding (Metropolitan-Vickers Electrical Co., Ltd.), 224*
— — 5,000-kw. Frequency Changing, Stourport Power Station, 144
— — for High-Tension Current Supply Wireless Apparatus, 224*
— Internal-Combustion. See *Aeronautics; Engines; Motor Cars; Tractors*
— Ladder and Pump, Leicester Fire Brigade, 132*
— Marine. See *Engines; Marine Propulsion; Motor Ships*
— Omnibuses, Pneumatic Tyres for, 18. See LETTER, 351
— — Six-Wheeled (Automobilwerk H. Bussing), 327*
— Paraffin. See *Engines, Oil*
— Petrol. See *Aeronautics; Engines, Petrol; Motor Cars; Tractors*
— Refuse-Collecting Cart with Screw Conveyor, 556*
— Road Rollers. See *Road Rollers*
— Ships, Cargo, Stoomvaart Maatschappij Nederland, Diesel Engines for, 412*
— — Comparisons with Steamers, 378*, 389, 430*
— — under Construction, Lloyd's Statistics, 484
— — "Greystoke Castle," Machinery of, 380*
— — "Kota Radja" and "Kota Inten," List-proof Davits for, 505*. See 541

Motor Ship "Lochmonar," Stresses in Stranded Condition, 409, 427*
— — Present Position of Diesel Engines, 39, 47
— — "Sibajak," Scheide-Sulzer Diesel Engines, 71*
— — Small, Design of (Review), 173
— — Steam Generation by Waste Heat, 243, 272. See 233, 265
— — Vibration of, Causes, 199. See LETTER, 227
— — "Zealandic," Machinery of, 525*
— — See also *Marine Propulsion*
— Spirit. See *Motor Fuel*
— Tractors. See *Tractors*
— Train Ferry "Korsör," Danish State Railways, 41*
— Transport, Competition with Railways in South Africa, 403
— — Liverpool's Requirements, 635
— — and the Railway Companies, 293. See 403
— — Road and Bridge Construction for, 726, 750
— — and Trade Development, Northern Africa, 130
— — Traffic Statistics, 726, 750
— Trucks, Electric Battery, Southampton Docks, 802. See 809.
— — with Hydraulic Lifting Gear, the Gerlinger, 13*
— Users' Association, Commercial, Annual Luncheon, 383
— Vehicles, German, Statistical Models, 736
— — M.A.N. Diesel Engine for, 328*
— — Springs, Endurance Tests of Steel Plates, 419
— — Suction Gas Producers for, 575
— — Vacuum Brake for, 667*
— Venner, for Clock Winding, 102
Mouchel, L. G., & Partners, Royal Tweed Bridge, Berwick, 527*, 615*
Moulding Machines, Wood. See *Machine Tools*
— Methods, Heavy Castings. Metropolitan-Vickers Electrical Co., Ltd., 66*
— See also *Foundry*
Moullin High-Frequency Ammeter, 655*
Moving-Coil Instruments, Graphical Determination of Constants, 338
Mowlem, J., & Co., Ltd., Tunnelling Work, Post Office Tube Railway, 92*
Mulder, I. R., On Brittleness in Chain Links, 2*
Multiple-Arch Dam, Lake Pleasant, Arizona, 159*
Multitubular Boilers. See *Boilers*
Municipal Electrical Association, Incorporated, Bath Meeting, Presidential Address by F. W. Purse, on the Effects of the Electricity (Supply) Act, 1926, 737; Administration of Electricity Supply Undertakings, by Col. A. Sinclair and J. W. Burr, 737; Distribution of Electricity in Cities and Towns, by L. Romero, 737; Distribution of Electricity in Rural Areas, by H. F. G. Woods, 737; Domestic Electrification, by J. L. Carr and J. D. Peattie, 738; Selling More Electricity for Domestic Purposes, by Lieut.-Col. W. A. Vignoles, 738
— Tramways. See *Tramways*
Murphy, A. J., on Failures of Wrought-Iron Chains, 618*, 652*. See 515*, 741
Murray, L., the Late, 411
Museum, Science, South Kensington, New Galleries, 356; Treatment of Officers, 382

N.

"NAGARA" S.S., Salvage by Ferro-Concrete Patch, 163*
Nailing Machine, Box (W. Fredenhagen), 283*
Nairn, W., the Late, 192
Nalder, Brothers, & Thompson, Ltd., Exhibits at Physical and Optical Societies' Exhibition, 69
Napier-Lion Aero Engine, Schneider Trophy Race, 632*
Nash, A. E., on Petroleum Refining and Cracking, 818
Natal, Bongwan, Natural Carbonic-Acid Gas Compressing Plant, 46
— Railways, Electrification of, 402, 481, 650*, 679*
National Coal Resources, Physical and Chemical Survey of, Report on Wigan Seam, Lancashire Coalfield, 414
— Exhibition, Toronto, British Participation, 482. See 612
— Federation of Iron and Steel Manufacturers, Annual Dinner, 674
— Gallery, Natural Lighting of, 716*
National Gas Engine Co., Ltd., Michell Crankless Gas Engine, 220*
— Physical Laboratory, Investigations of Fatigue Phenomena, 200, 232, 264; Froude Tank, Comparisons of Model Propellers in Air and Water, 409; Annual Report, 415; Endurance Tests, Steel Spring Plates, 419; Froude Tank, Investigation of Effect of Fins in Propeller Aperture, 438, 461*; Investigations of Accuracy of Hob-Cut Helical Gears, 465*, 531*, 598*; Investigations of Fatigue of Steel at Different Temperatures and Stresses, 557*, 578; Research on Chain Failures, 515, 618*, 652*. See 741; Investigations on Creep of Armco Irons, 672
— Savings and Engineering Export Trade, 484
Natural Carbonic-Acid Gas Compressing Plant, Bongwan, Natal, 46
— Gases from Petroleum and their Derivatives, 63
— — Utilisation in South Persian Oilfield, 341
— Lighting of Picture Galleries, 716*
— Science and Technology, 779
Naval Aeronautics. See *Aeronautics*

Naval Architects, Institution of:
Spring Meeting, London;
Election of Officers, 389
Induction of New President, Lord Wester Wemyss, 389

Naval Architects, Institution of—*continued.*
Presidential Address, by Lord Wester Wemyss, on the Shipbuilding Industry, 389
Report of Council, 389
Reports of Discussions, 389, 407, 437
Annual Dinner, 391
Presentation of Bust of Sir Philip Watts, 408
Present Position of the Question of Fuel for Ships, by Sir J. H. Biles, 378*, 430*. See 389
Bending and Loading of Ships, by J. F. King, 393*. See 391
Design and Propulsion of Fast Double-Ended Screw Vessels, by E. H. Mitchell, 397*. See 408
Note on Experimental Diesel Engines, by Eng. Capt. A. Turner, 425*, 462*. See 407
Relative Strength of Fine and Full Cargo Vessels, by E. L. Champness and F. McAlister, 408
Experimental Comparison of the Performance of Model Propellers Working in Air and in Water, by W. Sprague, 409
Effective Moment of Inertia of H.M.S. "Wolf," by G. H. Hoffmann, 410
Stresses in the Hulls of Stranded Vessels, by Prof. E. G. Coker, 427*. See 409
Cavitation, by J. Tutin, 439
Statistical Analysis of Voyage Abstracts, by J. L. Taylor, 440
Developments in Rigid Airship Construction, by Lieut.-Col. V. C. Richmond, 457*. See 325, 437
Experiments on the Propulsion of a Single-Screw Ship Model, by G. S. Baker and J. L. Kent, 461*. See 439
Vortex Theory of Propellers and its Application to the Wake Conditions Existing Behind a Ship, by W. G. A. Perring, 439
Naval Architects and Marine Engineers, Society of, Car Float Strength and Deflection, by Prof. E. Burtner and R. H. Tingey, 54; Design of Superstructures for Large Passenger Ships, by C. E. Petersen and L. Hansen, 54; The "Wampanoag"—The Fastest Ship in the World—1868, by J. Swan, 54; The Submarine of To-Day, by L. Y. Spear, 54; Model Tests with Adjustable-Blade Propellers, by Capt. W. McEntee, 54; Tank-Steamer Fires and Explosions, by R. L. Hague, 87; What is Naval Aviation Doing? by Capt. E. S Land, 88; Test of a Two-Cycle, Double-Acting Marine Diesel Engine, by E. Nibbs and S. A. Gardner, 88; Engines of the U.S. Shipping Board Conversion Programme, by Captain R. D. Gatewood, 88; Diesel Engines for the Navy, by E. C. Magdeburger, 89; Modern Trend of the Diesel Engine, by O. D. Treiber, 89
— Architecture, Bending Experiments, H.M.S. "Wolf," Effective Moment of Inertia, 410
— — Bending and Loading of Ships, 391, 393*
— — Relative Strength, Fine and Full Form Cargo Vessels, 408
— — See also *Warships*
— Base, Singapore, Floating Dock for, 84*
— Construction. See *Warships*
— Dockyards, British, Administration of, 249
— Engineers, Promotion of Engine-Room Artificers, 674
— History in the Law Courts (Review), 517
— Vessels, Diesel Engines for, 89
— Warfare. See *Warships*
— See also *Warships*
Navigation, Echo-Sounding Gear, Improved Form, 103
— Huson Superstellar Sextant, 103
— Inland, River St. Lawrence and Great Lakes Improvement, 62*, 114*, 125*, 137
— — Russia, Linking up Rivers Don and Volga, 715
Navvy, Steam. See *Excavating Machine*
Navy, British. See *H.M.* under *Warships*
— Chilean, Torpedo-Boat Destroyers for, 111. See 638
— Estimates, 1928–29, 325
— Italian, in World War (Review), 83
— Japanese, Stream-Line Filter for Oily Bilge Water, 150*
— United States. See *United States* under *Warships*
— Yard, Boston, Tests of Chain Links, 2*
— See also *Naval; Warships;* and PARAGRAPH INDEX
Naxos Union, Roll-Grinding Machine, 282*
Neal, R. H., & Co., Ltd., Menck Steam Pile-Driving Hammer, 491*
Nederland, Stoomvaart Maatschappij, Diesel Engines for Motor Cargo Ships, 412*
Negretti & Zambra, Exhibits at Physical and Optical Societies' Exhibition, 101*; at British Industries Fair, 221*
Neill, J., & Co., Ltd., High-Speed Steel Hack-Saw Blades, 639
New Year's Honours List, 20
New York, 132,000-volt Oil-Filled Cable Installation, 177*
Newcastle-on-Tyne, Steel Arch Bridge, Erection of, 266*
Newcomen Society, Steamboats of Lake Champlain, by L. F. Loree, 549
Newport, Mon., Talybont Water-Supply Scheme, 89
Newton, H. W., on the Sun's Cycle of Activity, 455
Niagara Falls, Preservation of, 418*
Nibbs, E., on Tests of a Marine Diesel Engine, 88
Nicholson Thermic Syphons, Locomotive Boiler, 347*
Nickel-Chromium Steel, Unusual Fracture in Tensile Test, 55*
— Influence on Cast-Iron, 579
— Sheets, Rolling Mills for Cold Rolling, 696
— Steel, Properties of, Influence of Manganese, 579, 632
Nitrate of Ammonium, Changes in, 655
Nitrogen Fixation, German Synthetic-Ammonia Industry, 536
Nitrogenous Fertilisers, British Investigations, 643
"No Screw" Hose Clip, 29*
Noble & Lund, Ltd., Grinding Machine for Axle Journals, Railway Rolling Stock, 637*
Noe, J. B., on 132,000-volt Cables, 177*
Noetzli, F. A., on Failure of St. Francis Dam, Los Angeles, 419*, 580*. See 452*, 547, 644
Non-Ferrous Metals. See *Metals; Metallurgy*
Norbury, Dr. A. L., on the Effects of Heat Treatment on Silver, 314
Normalising. See *Heat Treatment* under *Metallurgy*
North Atlantic, Western Ports of, Boston, 34*, 97*; Quebec, 183*
— East Coast Institution of Engineers and Shipbuilders, Vibration of Ships, by J. L. Taylor, 199. See LETTER, 227
— Eastern Marine Engineering Co., Ltd., Diesel Engine, M.S. "Greystoke Castle," 380*
— Notes from, 15, 45, 74, 104, 134, 167, 197, 235, 259, 291, 320, 352, 383, 415, 447, 478, 511, 541, 573, 607, 639, 669, 705, 739, 773, 805. See PARAGRAPH INDEX
— Road Automatic Substation, Brighton, 649*
— West England and North Wales Electricity Scheme, 811*
— — Midlands Electricity District, 546
Northern Africa, Report on Trade and Transport Facilities, 130
— Rhodesia, Trade of, Report, 273
Northfleet, Bevan's Cement Works, Deep-Water Jetty, 445
Notched-Bar Tests. See *Tests (Materials)*
Notes on New Books. See *Books* and LITERATURE INDEX
— See *Cleveland; Labour; North; South-West; South Yorkshire.* See also PARAGRAPH INDEX
Nozzle, Filter, for Petrol-Filling Pumps, 212*
— Steam Flow through, Investigation by Dimensional Theory, 80
— — Turbine, Report on Research, 107, 109*, 116*, 147*, 207*. See LETTER, 174
Nut-Making Machine (G. Wuttig.), 282*
— and Washers, Standard Specification, 308
Nyasaland, Trade of, Report, 273

O.

OAKDEN, J. C., On Flow of Steam through Nozzles, 80

Obituary:
Abetti, Prof. A., 446
Baird, A. W., 142
Buckham, Sir G., 612*
Chalmers, G., 175
Cornish, H. J., 486
Davey, H., 485*. See 515
Deutsch, F., 644
Dines, W. H., 22
Gardner, J., 571
Gaster, L., 44
Goethals, Major-Gen. G. W., 113
Goss, Dr. W., F. M., 581
Hay, Major J., 486
Holmes, A. B., 22. See *Erratum*, 54
Howell, S. E., 486
Hutchinson, G. L., 303
Insell, R. J., S., 414
Jackson, E., 259
Johnson, C., 714
Lange, F. M. T., 511
Lindsay, C. C., 22
Longridge, M., 112*. See 109
Lorentz, Prof. H. A., 175
Morgan, E. L., 73
Murray, L., 411
Nairn, W., 192
Peacock, Col. R., 317
Plummer, W. E., 668
Ransome, G., 540
Richardson, Sir A., 411
Roberts, D., 511
Sellon, R. P., 113
Siemens, A., 231*
Smith, A., 44
Vernier, C., 134
Walton, F., 714
Ward, H. T. S., 446
Wetton, C. E., 478
Willox, W., 453
Ocean Transport in International Trade, 635
Ogilvy & Co., Fardi Range Finder, 58*
Oil from Coal and Shale, Comparisons, 9
— Engines. See *Engines, Oil; Motor Cars; Tractors*
— Extraction Plant, Variable-Delivery Pressure Pump for, 288*
— Filled Cables, 132,000-volt, Design, Construction and Installation, 177*
— Film in Bearings, Distribution and Thickness of, 416
— Flow through Pipes, Alignment Charts, 498*
— Fuel Burners, Firing Refractory Materials, 336*
— — Firing Silica Refractory Materials with, 336*
— Fuel, Production from Coal, 671. See LETTER, 738
— — Ship Propulsion, Comparisons with Coal, 378*, 389, 430*
— Lubricating, Viscosity at High Pressures, 281
— — Viscosity at High Temperatures, 628
— Motors. See *Engines, Oil; Motor Cars; Tractors*
— Petroleum, Refining and Cracking, Use of Screened Radiated Heat, 818
— Production from Coal, 671. See LETTER, 738
— — by Flooding, 818
— Refining, Disposal of Sludge in, 818
— Switches. See *Switchgear*
— Tank Fires, Causes and Prevention, 296. See 360
Oil Tank, Protection from Lightning, 360. See 296
— — Steamers, Fires and Explosions on, 87
— Tractors. See *Tractors*
— Wells at Hardstoft, Derbyshire, 451
— — Increasing Yield by Compressed Air, 818
— Zwicky Pumps for, 37*
— See also *Lubrication; Petroleum*
Oilfields, Hydrogen-Sulphide Poisoning by Petroleum Vapours, 349
— South Persian, Natural Gas, 341
Oily-Bilge Water, Stream-Line Filter for Japanese Navy, 150*
Oldfield & Schofield, Ltd., Adjustable-Stroke Power Press, 224*
Olympia. See *Exhibition*
Omnibus, Motor. See *Motor Omnibus*
O'Neill, H., on Density Changes due to Cold-Working of Metals, 313
Opal Glass, Analysis of, 487
Open-Hearth Furnace. See *Furnace*
Opening Bridges. See *Bridges*
Optical Apparatus, Physical and Optical Societies' Exhibition, 49*, 68*, 101*
— Dividing Head for Machine Tools, 326
— Investigations, Stresses in Stranded Vessels, 409, 427*; Stresses in Arch Bridges, 810*. See 709
— Pyrometers. See *Pyrometers*
— Society, Exhibition of Scientific Apparatus, 49*, 68*, 101*. See 142, 175, 237*, 400*; Presidential Address, by Dr. R. S. Clay on the Stereoscope, 494
Optics, Dipleidoscope Prisms, Properties of 644
— History of the Stereoscope, 494
Ore, Chromium, World Supplies of, 440
— Crushing Plant, Appleby Iron Co., Ltd., 586
— Concentration, Froth Flotation, Gas Sorption in, 818
— — Froth Flotation, Sintering of Concentrates, 818
— Extraction, Ferric Sulphate-Sulphuric Acid Process, 30
— Iron, Frodingham Bed, 551*. See 584
— — Mining Operations, Appleby Iron Co. Ltd., 584*. See 551*, 578
— Lead-Zinc-Copper, Metallurgy of, 759, 787
— Mining Methods, Morro Velho Mine, 379
— Prospecting for, Electrical Method, 697
— — for, Use of Eotvos Torsion Balance, 219, 696
Orenstein & Koppel, Oil-Engine-Driven Excavating Machine, 285*
Organic Chemistry. See *Chemistry*
Ornamental Lathe, Free-Curve Attachment for 584*
"Oropesa," S.S., Cavitation and Propulsive Efficiency, 439
"Oroya," S.S., Cavitation and Propulsive Efficiency, 439
Oscillograph. See *Electric*
Oudet, J., on the Use of Liquid Oxygen in French Railway Workshops, 694*
Ovens, Coke. See *Coke Ovens*
Overhaul Works, Acton, London Underground Railways, 645*
Overhead Cranes. See *Cranes*
— Electric Power Transmission Engineering (Review), 344
— Lines Association, Overhead Lines Design, by W. Fennell, 545
— — Construction, Catenary System, Electrification of South African Railways, 652*
— — Electricity Distribution in Rural Areas, 737
— — Power Transmission, Grid System, 704, 724
— — Power Transmission, Lanarkshire Water Power Plants, 794
— — Power Transmission, New Regulations, 545
Overseas Department, Board of Trade Commercial, Economic and Financial Conditions of the Argentine Republic, 108; Report on Economic and Commercial Conditions in Northern Africa, 130; Report on Economic and Financial Conditions in Germany, 157; Report on Trade and Commerce of East Africa, 273; Report on Indian Import Trade, 299; Report on Economic Conditions in United States, 466; Report on Industrial and Economic Situation in Chile, 548; Report on Economic Situation in Belgium, 610
Oven, Electric, Freas, 101
Oxy-Acetylene Welding. See *Welding*
Oxygen-Demand Test, River Pollution, 544
— Liquid, for Blasting, Chilean Mines, 818
— — Use for Cutting and Welding, French Railway Workshops, 694*

P.

P.I.V. Variable-Speed Gear, Milling Chain Wheels for, 256*
Page, A., On Power Transmission over Large Areas, 724. See 704
Paint Mill, Single-Roller Type (S. Smith & Blyth, Ltd.), 475*
— Preparation of, 778
— Shop, Acton Overhaul Works, London Underground Railways, 646
— and Varnishes, Standard Specifications, 756, 803
— Wear on Railway Rolling Stock, 779
Panama Canal, Annual Report, 80; Statistics, 276, 443
Panel System, Radiant Heating of Buildings, 139, 791
Pantograph Current-Collector Gear, Brown-Boveri Electric Locomotive, 298*
Papers, Insulating, Microscopic Examination, 620*
Paraffin Engines. See *Engines, Oil*
— Tractors. See *Tractors*
Paraguay, Report on Economic Conditions, 804
Paris-Orleans Railway, Electrification of, 200
Parker, C. F., on the Kinematics of the Andreau Differential-Stroke Engine, 277*

Parker, J. W., on the Conditions of Carriage by Rail, 503
Parmotor Electro-Magnetic Relay, 411*
Parr, S. W., on Surface Tension of Solders, 212
Parsons, C. A., & Co., Ltd., Turbo-Generators, Guildford Power Station, 713*. See 709
Parsons, H. de B., on Hydrostatic Uplift in Pervious Soils, 514
Parsons Turbines. See *Turbines, Steam: Marine Propulsion*
Passenger Steamers. See *Steamers*
— Train, Carriage of Goods by, Payment of Charges, 645
Patchell, W. H., on the Present Trend in Boiler Practice, 723. See 703
Patent Record, 60*, 90*, 152*, 244*, 496*, 624*, 686*, 822*. See PATENT RECORD INDEX
Pattern Shops, Metropolitan-Vickers Electrical Company, Ltd., 123*
Paving Bricks for Roads, Tests of, 96
Payman, Dr. W., on Coal-Mining Explosives, 715
Payment of Labour. See *Labour*
Peabody Pulverised-Fuel Burner, 432*
Peacock, Col. R., the Late, 317
Peacock Feathers, Fading in Ultra-Violet Light, 655. See 779
Pearce, Dr. S. L., on Developments in the Generation of Electricity, 753*. See 728
Peattie, J. D., on Domestic Electrification, 738
Peebles, Bruce, & Co., Ltd., Works of, 811
— La Cour Motor Converters, Automatic Substation, Brighton, 649*
Pels, H., 200-ton Press for Finishing Laminated Springs, 283*
Pelton Wheels, 30,000-h.p., Bhira Power Station, 747*, 771*; Exciter Sets, 821*
Penberthy Sump-Draining Pump 509*
Pendulum Hardness Tester, Properties of Cutting Tools, 51
Pennsylvania Crusher Co., Coal-Breakers, Trenton Channel Power Station, 434*
— Railroad, Altoona Locomotive Testing Plant, Experimental Results on Three-Cylinder Compound Engine, 103
Perl, A. H. F., Adjustable-Stroke Power Press, 224*
Permanent Magnets. See *Magnets*
— Set Helical Springs, Method of Avoiding, 711*
— Way Construction, Post Office Tube Railway, 153*
— — Design and Maintenance, Effect of Electrification, 700, 720. See 814
— — Equipment, Electrification of South African Railways, 652*
— — Ferro-Concrete Sleepers, 700. See 720
— — Historial Exhibits, Institution of Civil Engineers Conversazione, 708
— — Standard Specification for Fishplates, 340
— — Tramway, Standard Specification, 623
— — Use of Chromium-Steel Rails and Fishplates, 602, 617, 632
Permutit Domestic Water Softening Plants, 483
Peroxide of Sodium Bomb Calorimeter, 623*
Perring, W. G. A., on the Vortex Theory of Propellers, 439
Persia, Telegraph System of, 209*
Persian Oilfield, Utilisation of Natural Gas, 341
" Petrel " Shallow-Draught Gunboat, 333
Petersen, C. E., on the Design of Superstructures for Passenger Ships, 54
Petrol-Filling Pumps, Filter Nozzle for, 212*
— Motors. See *Aeronautics; Engines, Petrol; Motor Cars; Tractors*
— Production from Natural Gas, 63
— Tractors. See *Tractors*
— Zwicky Hand Pump for, 38*
Petroleum, Natural Gases from, and their Derivatives, 63
— Production by Flooding, 818
— Refining and Cracking, Use of Screened Radiated Heat, 818
— — Disposal of Sludge in, 818
— Tank Fires, Causes and Prevention, 296. See 360
— — Protection from Lightning, 360. See 296
— Technologists, Institution of, Causes of Fire in the Petroleum Industry, with Methods of Prevention, by C. Dalley, 296. See 360; Development Problems in the Exploitation of Natural Gas, by Lieut.-Col. S. J. M. Auld, 341; Oil Wells at Hardstoft, by Dr. A. Wade, 451; Viscosity of Lubricating Oils at High Temperatures, by H. S. Rowell and D. Finlayson, 628
— Vapours, Poisoning by Hydrogen Sulphide in, 349
— Wells at Hardstoft, Derbyshire, 451
— — Increasing Yield by Compressed Air, 818
— See also *Oil; Paraffin; Engines, Oil*
Petters, Ltd., Two-Cycle Oil Engine and 8-kw. Electric Generator, 204*
Philadelphia, Delaware River Suspension Bridge, Design of, 1
Phillips, H. W. L., on Aluminium Alloys, 179*, 210*
Phosgene, Escape of, at Hamburg, 668
— Gas, Properties of, 668
Photo-Elasticity. See *Optical Determination of Stress*
—Electric Phenomena, Modern Theories, 201
Photographic Aerial Surveying, Treatise on (Review), 141
— Survey of Rio de Janeiro, 486
Photography in Colours (Colour Photographs, Ltd.), 779
Photometer, Light Reflection from Ground, 779
Photomicrographs. See *Microphotographs*
Physical Apparatus, Physical and Optical Societies' Exhibition, 49*, 68*, 101*. See 142, 175, 237*, 400*
— and Chemical Survey of National Coal Resources, Report on Wigan Seam, Lancashire Coalfield, 414
— Chemistry. See *Chemistry*
— Inventions and the Development of Engineering, 709, 755. See 707.
Physical Laboratory. See *National Physical*
— Properties of Arc, Electric Welding, 777

Physical Society:
Exhibition of Scientific Apparatus, 49*, 68*, 101*. See 142, 175, 237*, 400*
Simple Graphic Method for the Determination of Galvanometer and Fluxmeter Constants, with a Note on the Measurement of Intense Magnetic Fields, by Dr. A. Ferguson and E. J. Irons, 338
Application of Electrical Resistance Measurements to the Study of the Atmospheric Corrosion of Metals, by J. C. Hudson, 338
Some Methods of Estimating the Intensities of Spectral Lines, by W. H. J. Childs, 486
Electrical Methods of Hygrometry, by P. W. Burbidge and N. S. Alexander, 487
Experiments with Mercury Jets and the Phenomena Exhibited at their Impact with Steel and Glass, by Prof. W. C. Baker, 572
Valve-Maintained High-Frequency Induction Furnace, and some Notes on the Performance of Induction Furnaces, by G. E. Bell, 572
Blowing Selenium Bubbles, Demonstration by Major C. E. S. Phillips, 572
Physicists and Engineers, Relationship, 163. See LETTER, 227
Physics in Astronomy, 612
— Artificial Daylight, Production and Properties, 142
— Collected Papers of Sir J. C. Bose (Review), 141
— Crispations of Liquids, 644
— Faraday's Notebooks, 235
— Fluorescence of Minerals in Ultra-Violet Light, 655
— Ice and Regelation, Faraday's Notebooks, 235
— Institute of, Presidential Address by Sir F. Dyson, on Physics in Astronomy, 612
— Light and Electricity, Relationship, Modern Theories, 201. See 506
— — Wave and Corpuscular Theories, 506. See 201
— Magnetic Fields, Intense, Investigations, 219, 338
— Mercury Jets, Impact with Steel and Glass, 572
— Modern Theories of, 506
— Selenium Films, Production by Bubble Blowing, 572
— Sound Recording and Reproducing Apparatus, Gramophone, Progress with, 400*
— Spectral Lines, Estimating Intensity of, 486
— Spectroscopy, Treatise on (Review), 371
— Surface Tension, Methods of Measurement, 212
— — Tension of Solders, 212
— Transformation of Matter, 315*, 360*, 387*, 422*
— Treatise on (Review), 602
— Wave Mechanics, Prof. G. P. Thomson's Experiments, 506
— See also *Physical Society* and PARAGRAPH INDEX
Physiological Effects, Sulphuretted Hydrogen, 349
— — Wheel-Barrow Work, Investigations, 817
— Problems, Deep Mining, 759, 787
Physiology, Collected Papers of Sir J. C. Bose (Review), 141
— Gas for Therapeutical Purposes, 770
Pickles, J., & Son (Engineers), Ltd., Woodworking Machinery at Building Exhibition, 477*
Picture Galleries, Natural Lighting of, 716*
Piecework. See *Labour*
Piers and Sheds, Port of Boston, 34*, 97*
— at Vancouver, Piling Operations, 202
Pietermaritzburg-Glencoe Section, South African Railways, Electrification, 650*, 679*. See 402, 481
Piezo-Electric Resonators, Mode of Vibration, 644
Pig-Iron Industry, British, Position of, 674
— — Prices. See *Metal-Price Diagrams*
Pigment, Carbon Black, Production from Natural Gas, 63
Pile-Driving Hammer, Steam, the Menck, 491*
Piles, Ferro-Concrete, Deep-Water Jetty, Northfleet, 445
— — Concrete, Manufacture and Driving, Pier at Vancouver, 202
— — Concrete, Recent Developments, 719
— — Concrete, Sinking by Compressed Air, 510
Piling, Ferro-Concrete, Royal Edward Dock Extension, Avonmouth, 567*
— Sheet, Earth Pressure on, 303
— Timber, San Francisco Bay, Destruction by Marine Boring Organisms, 757*
— Work, Jetty and Pump House Construction, Barking Power Station, 319
Pinions. See *Gears; Gearing; Marine Propulsion*
Pipes, Buried, Temperature Fluctuations at Different Depths, 608
— Corrugated, Water Flow in, 110*
— Ferro-Concrete, Billé Rubber Joint for, 803*
— Flanges, Standard Tables, 715
— Flow of Viscous Liquids through, Alignment Charts, 498*
— Joints, Victaulic, Use for Marine Purposes, 772
— Lines, Lanarkshire Water Power Plants, 768*
— — Water Power Plants, Progress in Design, 786. See 759
— Manufacture, Lead Alloys for, 685
— Steam. See *Steam Pipes*
— Water, Concrete, Chemical Action of Water on, 111. See *Erratum*, 202
— Wrench, Thurley, 255*
— See also *Tubes*
Piston Rings, Diesel Engines, Gas Pressures Behind, 462*
Pit Props, Tests of, Safety in Mines Research Board, 28
Pitch, Gear-Teeth, Permissible Errors, 280*
Planing Machine. See *Machine Tools*
Plant, Industrial, Assessment for Rating, 258
— — Proposed Rates Reduction, 775
Plates, Boiler, Thermal Stresses in, 777
— Flat, Deflections of, Experimental Investigations, 31*. See *Erratum*, 83
— Girders, Design of, 262
— Handling Machines, Magnetic, Rolling-Mill Plant, 553*
— Rolling Mills, Appleby Iron Co.'s Works, 552*, 588*
— Steel, for Springs, Endurance Tests, 419
— — Prices. See *Metal-Price Diagrams*
Plating, Electro. See *Electro*
Platinum-Resistance Pyrometers. See *Pyrometers*
Ploughing, Hydraulic Traction Dynamometer for, 538*
Plugs and Sockets, Electrical, Standard Specification, 59, 257
Plumber, Automatic, for Jointing Lead-Sheathed Cables, 254*
Plummer, W. E., the Late, 668
Pneumatic Elevator, Travelling, for Grain, Avonmouth Docks, 591*
— Tools. See *Machine Tools*
— Tyres for Motor Omnibuses, 18. See LETTER, 351.
— See also *Compressed Air; Air Compressor*
Poisoning by Hydrogen Sulphide in Petroleum Vapours, 349
Polarised Light. See *Light* and *Optical Determination of Stress*
Poley, H., on Waste Heat in Cement Manufacture, 497, 562
Pollitt, Lieut.-Col. C. P., on the Heavy Chemical Industry, 643. See *Erratum*, 665
Pollution, River Illinois, and Self-Purification, 544
— — Oxygen Demand Test, 544
— — and Water Supply, Research, 218
— of Tidal and Non-Tidal Rivers, 612
Polytechnic. See *Education*
Poplar Power Station, Pulverised-Fuel Firing, Electric Control, 145*. See 85*
Port of Bari, Italy, Harbour Construction Works, 245*. See *Addendum*, 382
— of Bristol, Extension of Royal Edward Dock, Avonmouth, 565*, 591*. See 644
— Destruction of Marine Structures by Boring Organisms, 757*
— Dimensions of Approaches, 725, 749*
— of Liverpool, Mersey Docks, Management and Trade, 634
— of Southampton, Development of, 800*, 809
— Western, of North Atlantic, Boston, 34*, 97*; Quebec, 183*
Portable Engine. See *Engine*
— Machine Tools. See *Machine Tools*
Porter, G., on Heavy Internal-Combustion Engines, 752. See 727
Portland Cement. See *Cement*
Portobello Power Station, Edinburgh, Visit of Institution of Electrical Engineers, 811; Switchgear, 815*
Post Office Telephones, London Area, Development, 170
— — Underground Railway for Mails, 92*, 153*, 214*, 250* 309*. See LETTER, 299
Potable Water, Microscopy of (Review), 780
Potentiometer. See *Electric*
Poumay Cupola with Auxiliary Tuyeres, 744*
Powdered Coal. See *Pulverised Coal*
Power Alcohol. See *Alcohol; Motor Fuels*
— Electric, Continuity of Supply, Economic Value, 77
— — Distribution, Avonmouth Dock Extension, 598
— — In London, Charges for, 20
— — Private Supply of, Lawsuit, 19
— — Production, Use of Coal By-Products in 742
— — Statistics of Production and Fuel Consumption, 450, 799.
— Gas. See *Gas; Engines, Gas; Producers*
— Hammer. See *Hammer* under *Machine Tools*
— Increased Use in Industry, 449, 467
— Plants, Hydro-Electric, Bonnington and Stonebyres, Lanarkshire, 767*, 791*
— — Hydro-Electric, in France, Recent Developments, 200
— — Hydro-Electric, Ice Problem, 759, 786. See 514
— — Hydro-Electric, Progress in, 759, 786
— — Hydro-Electric, River St. Lawrence Improvement, 62*, 114*, 125*, 137
— — Hydro-Electric, Shawinigan Falls, Electrically-Heated Trash Screens, 514
— — Hydro-Electric, United States and Canada, Public and Private Ownership, Comparisons, 642
— — See also *Power Stations; Power, Water; Substations*
— Press. See *Machine Tools*
— Production, Alcohol for. See *Alcohol; Motor Fuels*
— — from Sludge Gas, Saltley Sewage Works, 162
— — from Tides, French Projects, 200
— — from Tides, Possibilities of, 759, 785
— and Steel Show, Toronto, British Participation, 482, 612
— Stations, Condensing-Water Supply, Legal Position, 170
— — Electric, Appleby Iron Co., Ltd., 551, 586
— — Electric, Barking, Jetty and Pump House Construction, 319; Carbon-Dioxide Fire-Extinguishing Installation, 441*
— — Electric, British, Foreign Plant in, 172
— — Electric, Central England Electricity Scheme, 454*
— — Electric, Colenso, South African Railway Electrification, 651. See 402
— — Electric, Doncaster, Extensions, 511
— — Electric, Electricity Commissioners' statistics, 356
— — Electric, Factors Affecting Design, 728, 753*
— — Electric, Gouda, Holland, Flue Dust Collector, 223*
— — Electric, Grove Road, London, Flue-Dust Collector, 223*
Power Stations, Electric, at Guildford, 709. See 713*
— — Electric, Hamburg, Diesel Engines for Peak Loads, 546. See 514, 540
— — Electric, Klingenberg, Berlin, 58
— — Electric, Lakeside, Milwaukee, Operating Experiences, High-Pressure Steam, 25*, 55*
— — Electric, Load Factors 356, 450, 704, 724
— — Electric, North-West England and North Wales Electricity Scheme, 811*
— — Electric, Poplar, Pulverised-Fuel Firing, Electric Control, 145*. See 85*
— — Electric, Portobello, Edinburgh, Visit of Institution of Electrical Engineers, 811; Switchgear, 815*
— — Electric, Present Trend in Boiler Practice, 703, 723
— — Electric, Pulverised Fuel for Boiler Firing, 742
— — Electric, Shanghai, Extensions at, 685. See 805
— — Electric, South-East England Electricity Scheme, 17, 230
— — Electric, St. Pancras, Extensions, 22
— — Electric, Statistics of Fuel Consumption and Units Generated, 450, 799
— — Electric, Stourport, Coal-Handling Plant, 11*; 5,000-kw. Frequency Changer, 144
— — Electric, Thermal Efficiency of, 450, 799
— — Electric, Trenton Channel, Detroit Edison Co., 341*, 360*, 433*, 499*, 532*. 603*, 629*, 660*, 690*, 782*, 795*
— — Electric, Use of Coal By-Products in, 742
— — Electric, Use of Diesel Engines, 514, 545. See LETTER, 540
— — Electric, Use of Gas Engines, in, 743
— — Electric, Using House Refuse, Govan, 549
— — Hydro-Electric, Bhira, Tata Hydro-Electric Power Co., 747*, 771, 819*
— — Hydro-Electric, Rheinfelden, Reconstruction, 494
— — See also *Power Plants; Substations*
— Supply, Electric, Administration of Undertakings, 737
— — Electric, Averaging Recorder for, 393*
— — Electric, Central England Scheme, 454*
— — Electric, Distribution in Cities and Towns, 737
— — Electric, Distribution in Rural Areas, 737
— — Electric, Domestic Uses, 738
— — Electric, Effect of Domestic Heating and Lighting on Load Factor, 704, 724
— — Electric, Effect of Recent Legislation, 17, 737
— — Electric, Effect of Tariffs on Consumption, 388
— — Electric, Electricity Commissioners' Statistics, 356
— — Electric, North-West England and North Wales Electricity Scheme, 811*
— — Electric, North West Midlands District, 546
— — Electric, in Shanghai, 685, 805
— — Electric, South-East England Scheme, 17, 230
— — Electric, Southampton Docks, 803. See 809
— — Electric, United States, Statistics, 202
— Transmission, Electric, over Large Areas, 704, 724
— — Electric Overhead, Treatise on (Review), 344
— — Overhead Lines, Grid System, 704, 724
— — Overhead Lines, Lanarkshire Water-Power Plants, 794
— — Overhead Lines, New Regulations, 545
— — Overhead Lines, for Rural Areas, 737
— — See also *Gearing; Marine Propulsion*
— Water, Bhira Plant, Tata Hydro-Electric Power Co., 747*, 771*, 819*
— — Development of, Ice Problem, 759, 786. See 514
— — in France, Present Position, 200
— — Italy, Dams for Development, 238
— — Lanarkshire, Bonnington and Stonebyres Power Stations, 767*, 791*
— — Preservation of Niagara Falls, 418*
— — Progress in Installations, 750, 786
— — River Congo, Proposed Development, 685
— — River St. Lawrence and Great Lakes Improvement, 62*, 114*, 125*, 137
— — Shawinigan Falls Plant, Electrically-Heated Trash Screens, 514
— — United States and Canada, Public and Private Ownership, Comparisons, 642
— — of the World, Statistics, 206
— — See also *Hydraulic; Power Plants, Hydro-Electric; Pelton Wheels; Turbines, Hydraulic*
Pozzuolana Concrete, Harbour Construction Works, Bari, Italy, 245*. See ADDENDUM, 238
— Building Research Board Investigations, 120
Pragos Engineering Co., Ltd., Clay Proportioning, Mixing and Feeding Machine, 510
Preheaters, Air, Howden-Ljungström, Shanghai Power Station, 685
— — Marine Boilers, Advantages of, 323. See LETTER, 351
Premier Gas Engine Co., Ltd., 150-h.p. Three-Cylinder Horizontal Oil Engine, 204*
Prentice, F., on Waterless Gasholders, 722. See 702
Presidential Address to Incorporated Municipal Electrical Association, by F. W. Purse, on the Electricity (Supply) Act, 1926, 737
— — to Institute of Metals, by Dr. W. Rosenhain, on the Equilibrium Diagram, 296
— — to Institute of Physics, by Sir F. Dyson, on Physics in Astronomy, 610
— — to Institute of Transport, by R. T. Smith, on Swiss Railway Electrification, 481
— — to Institution of Civil Engineers, by E. F. C. Trench, on the History and Prospects of the Institution, 707. See 699
— — to Institution of Gas Engineers, by H. D. Madden, on the Gas Industry, 743
— — to Institution of Naval Architects, by Lord Wemyss, on Shipbuilding Industry, 389
— — to Institution of Professional Civil Servants, by Sir R. Redmayne, on the Status of Civil Service Engineers, 484

Presidential Address to Iron and Steel Institute, by B. Talbot, on the Basic Open-Hearth Process, 547
— — to Optical Society, by Dr. R. S. Clay, on the Stereoscope, 494
Press. See *Machine Tools*.
Pressure Piling Co., Ltd., Sinking Ferro-Concrete Piles by Compressed Air, 510
— Produced by Arcing in Closed Vessels, 715
— — by Blowing Fuses, 715
— Regulator, Steam, Galloway Heat-Extraction Engine, 318*
Prestall Vacuum-Brake Cylinder, 144
Preston Park Automatic Substation, Brighton, 549*
Prices of Metals. See *Metal-Price Diagrams*
Printing, Typesetting, Effect of Lighting on Output and Accuracy, 504
Prisms, Dipleidoscope, Properties of, 644
Private Supply of Electricity, Caerphilly Urban District Council *versus* Griffin, 19
Processing System, Locomotive Repairs, Crewe Works, 364*. See 355, 359
Producer-Gas Engine. See *Engines, Gas*
— — Maclaurin Smokeless-Fuel Plant, 128*
— — Plant, Crewe Locomotive Works, 366*
— — Plants, Steam Generation by Waste Heat, 243. See 233, 264, 272
— — Utilisation of, 702, 722
— Suction Gas, for Road Vehicles, 575
Professional Civil Servants, Institution of, Presidential Address, by Sir R. Redmayne, on Status of Civil Service Engineers, 484
Profit Sharing. See *Labour*
Propellers, Adjustable-Blade, Model Tests, 54
— Aerial. See *Aeronautics*
— Bow and Stern, Passenger Steamers for Sydney Harbour, 397*, 408
— Model, in Air and Water, Comparisons, 409
— Screw, Conditions Producing Cavitation, 439
— — Model Experiments, Effect of Fins in Propeller Aperture, 438, 461*
— — Vortex Theory and Application, 439
Propulsion of Ships. See *Marine Propulsion; Engines; Turbines; Propellers*
Prospecting, Electrical Method, 697
— Use of Eötvös Torsion Balance, 219, 696
Pugmill, Elevating, for Clay (H. & E. Lintott), 509*
Pullin, V. E. A., on Uses of X-Rays, 175
Pulp, Wood, for Insulating Papers, Microscopic Examination, 620*
Pulsometer Engineering Co., Ltd., Exhibits at British Industries Fair, 223*
Pulverised Fuel, Boiler Firing, Progress with, 323, 742
— — Burner, Short-Flame (International Combustion), Ltd., 182*
— — Burners, Short-Flame, for Marine Installations, 431*
— — Burners, Trenton Channel Power Station, 501*
— — Equipment, Shanghai Power Station, 685
— — Firing, Boilers, Electric-Control Gear, 145*. See 85*
— — Plant, Klingenberg Power Station, 58
— — Plant, Trenton Channel Power Station, 433*, 499*
— — Ship Propulsion, Comparisons, 379, 430*. See 389
— — Use in Open-Hearth Furnaces, 808
Pulverising Mills, Coal, Raymond, Trenton Channel Power Station, 435*
Pumps, Air. See also *Air Compressors*
— Automatic, for Sump Draining, Penberthy, 509*
— Centrifugal, Boiler Feed and Hot-Well, Trenton Channel Power Station, 662*
— —Circulating, Trenton Channel Power Station, 690*
— Fuel, Davey-Paxman Cold-Starting Oil Engine, 225*
— Hand-Operated, for Petrol (Zwicky, Ltd.), 38*
— House, Barking Power Station, Construction, 319
— Petrol-Filling, Filter Nozzle for, 212*
— Reciprocating, High-Duty, for Oil (Zwicky, Ltd.), 37*
— Rotary, Positive-Action Type (Hollings & Guest, Ltd.), 221*
— Vacuum, Dry, Laidlaw-Dunn-Gordon Type, Trenton Channel Power Station, 663*
— — Mercury-Vapour, Dunoyer System, 101
— Variable-Delivery, Williams-Janney Type, for Hydraulic Accumulator, 288*
— — Stroke, for Oil or Petrol (Zwicky, Ltd.), 38*
Pumping Plant, Southampton Docks, 801
Punching Plant, Laminations, Electrical Machinery, Metropolitan-Vickers Electrical Co., Ltd., 186*
Punjab, Drainage Systems, Upper Jhelum Canal, 20
Purification of Sewage. See *Sewage*
— of Water. See *Water*
Purse, F. W., on the Electricity (Supply) Act, 1926, 737
Pyrometer for Surface Temperature Measurements (Negretti & Zambra), 102*
— Temperature Recorder for (Negretti & Zambra), 221*
Pyrometry, Temperature-Deviation Indicator, Cambridge Signal-Lamp Type, 50
— Treatise on (Review), 472

Q.

QUANTUM and Relativity Theories of Light, 372
Quarries, Alsop-en-le-Dale, Petrol Shunting Locomotive, 8*
Quarrying Sandstone, Grindstone Manufacture, 519
Quartz Fibres, Direct-Reading Micrometer for, 655*
— Plate Piezo-Electric Resonators, Mode of Vibration, 644
Quay, Ferro-Concrete, Sectional Construction, Royal Edward Dock Extension, Avonmouth, 568*
Quebec, Port of, Arrangement and Equipment, 183*
Quenching of Steel. See *Heat Treatment* under *Metallurgy*
Quicksilver. See *Mercury* and *Metal-Price Diagrams*

R.

"R.5101," H.M. Airship, Design and Construction, 437, 457*. See 325
Radial Drill. See *Drill* under *Machine Tools*
Radiant Heating, Buildings, Panel System, 139, 791
Radiation, Modern Theories of Light and Electricity, 201, 506
— Pyrometers. See *Pyrometers*
Radiators, Low-Temperature Panels, Heating Buildings, 139, 791
Radioactivity and the Transformation of Matter, 315*, 360*, 387*, 422*
Radiological Branch, Woolwich Research Department, Exhibits at Royal Society Conversazione, 655
Radiotelegraphy. See *Telegraphy, Wireless*
Radiotelephony. See *Telephony, Wireless*
Railroad, Pennsylvania, Altoona Locomotive Testing Plant, Experimental Results on Three-Cylinder Compound Engine, 103
— Sacramento Northern, Electric Locomotives for, 664
— See also *Railways*
Rails, Chromium-Steel, Behaviour in Service, 602, 617, 632
— Steel, Manufacture of, 696
— — Prices. See *Metal-Price Diagrams*
Railway Accidents. See *Accidents*
— Alsace-Lorraine, Use of Liquid Oxygen in Workshops, 694*
— Argentine, Present Position, 108
— Axles, Magnetic Detector for Cracks, Acton Works, 646
— Bridge. See *Bridge*
— Canadian National, 4-8-4 Type Locomotive for, 347*, 473*
— and Canals, Early Competition, 710
— Carriage. See *Carriage*
— Companies, Charges for Goods by Passenger Train, 645
— — and Road Transport, 293. See 403
— Construction, Materials for, 700, 719 See *Erratum*, 739
— Danish State, Motor Train Ferry "Korsör," 41*
— Development of, Historical Exhibits, Institution of Civil Engineers Conversazione, 708
— Electric, Camshaft-Control Gear for Trains (English Electric Company, Ltd.), 155*. See 214*
— — Direct-Current Motor-Control Equipment (General Electric Co., Ltd.), 204*
— Electrification, Effect on Track Design and Maintenance, 700, 720. See 814
— — France, Present Position, 200
— — Operating Results, 481
— Goods Transport, Legal Position, 503
— Great Indian Peninsula, Electric Locomotive for, 297*
— of 'Iraq, Report on, 776
— Locomotive. See *Locomotive*
— London, Midland & Scottish, Reorganisation of Crewe Works, 358, 362*. See 355, 414; Use of Chromium-Steel Rails, 602, 617, 632; Co-Operation Scheme, 636
— — Suburban, Proposed Extensions, 19
— and Motor Transport Competition in South Africa, 403; in England, 293
— Natal, Electrification of, 402, 481, 650*, 679*
— Northern Africa, Development, 130
— Permanent Way, Standard Specification for Fishplates, 340
— Rates Reduction, Suggested State Aid, 776
— and Road Transport, 293, 403
— Rolling Stock, Grinding Machine for Axle Journals, 637*
— — Stock, London Underground Railways, Acton Overhaul Works, 645*
— — Stock, Wear of Paints on, 779
— — Stock. See also *Carriages; Locomotives; Wagons*
— Russian, Diesel-Engine Locomotive Trials, 504
— Signalling. See *Signalling*
— South African, Electrification of Pietermaritzburg–Glencoe Section, 650*, 679*. See 402, 481
— — African Government, Report, 402
— Southern, Accidents at Sevenoaks and Bearsted, Reports, 138; Electrification of, 481; Charing Cross Station, Proposed Removal, 513, 609. See 738
— Street. See *Tramways*
— Swiss, Electrification of, Operating Results, 481
— Track, Design and Maintenance, Effect of Electrification, 700, 720. See 814
— — Use of Ferro-Concrete Sleepers, 700. See 720
— Train Brake. See *Brake*
— Tube. See *Underground*
— Underground. See *Underground*
— Wagons. See *Wagons*
— Wheel Lathe, Semi-Automatic (W. Hegenscheidt), 283*
— Works, Locomotive Repair Shops, Transverse or Longitudinal Arrangement, 355. See 358, 362*
— Work, Steels for, 695
— See also *Railroads* and PARAGRAPH INDEX
Rainfall, Intensity and Duration, 788*, 790*
— and Run-off Ground, Manchester Main Drainage, 760, 789*
Range Finder, Fardi, for Industrial Use, 58*
Ransome, G., the Late, 540
Ransome, A., & Co., Ltd., Portable Power-Driven Cross-Cut Saw for Logs, 179*
Ransomes & Rapier, Ltd., Automatic Tilting Weirs, Lanarkshire Water-Power Plants, 767*
Rates, Railway, Suggested State Aid for Reduction, 776
Rather, J. R., on Disposal of Sludge in Oil Refining, 818
Rating, Basis of, Valuation and Depreciation in (Review), 693
— Industrial Premises and Plant, Assessment for, 258
— — Premises and Plant, Government Proposals, 775
Rational Carbonisation Syndicate, Ltd., Dvorkovitz System, Low-Temperature Carbonisation, 72*
Ray, R., on Coke-Oven, Town and Producer Gas, 722. See 702
Rayleigh, Lord, Fading of Peacock Feathers in Ultra-Violet Light, 655. See 779
Raymond Coal-Pulverising Mills, Trenton Channel Power Station, 435*
Reactions, Chemical. See *Chemistry*
Reactivity of Coke, 276, 578, 800
Reamers, Standard Tolerances for Diameters, 729
Reavell & Co., Ltd., Exhibits at British Industries Fair, 222*
Recalescence Curves. See *Metallurgy*
Recessing Machine, Double-Spindle, for Stair Strings, 508*
Reclamation and Dredging Work, Royal Edward Dock Extension, Avonmouth, 566*
— Work, Southampton Dock Extensions, 803
Recorder, Averaging, Electric Power Supply, 393*
— Stress, Cambridge, Use with Traction Dynamometer, 538*
— Temperature, for Pyrometers (Negretti & Zambra), 221*
Recording Dynamometer. See *Dynamometer*
— Potentiometer with Hot-Wire Motor, Cambridge, 49*
Rectifiers, Mercury-Arc, Principles and Circuits (Review), 173
— Synchronous-Motor Type, for Kinematograph Projectors, 254*
— and Valves, Treatise on (Review), 472
Redmayne, Sir R., on the Status of Civil Service Engineers, 484
Reduction Gears. See *Gears; Marine Propulsion; Motor-Car Details*
Refining Oil, Disposal of Sludge, 818
— Petroleum, Use of Screened Radiated Heat, 818
Reflection of Light from Ground, Photometer for Measuring, 779
Refractometer, Binocular (Bellingham & Stanley, Ltd.), 102*
— Ultra-Violet, Hilger's, 49
Refractory Materials, Gas Industry, Report on, 800
— — Silica, Firing with Oil Fuel, 336*
Refrigerating Plant, Ammonia Compressors (Pulsometer Engineering Co. Ltd.), 223*
— — Cold Stores, Southampton Docks, 802
— — Sulphur-Dioxide and Ammonia Compressors (R. Boby, Ltd.), 226*
Refrigeration, Progress in, 755
— See also *Cold Storage*
Refuse-Collecting Cart, Motor, with Screw Conveyor, 556*
— Power Plant at Govan, 549
Regenerative Furnace. See *Furnace*
Register, Shipping and Aircraft, British Corporation, Work of, 357; Rules and Tables, 738
Registration of Engineers in Australia, 780
Regulations, Overhead Power-Transmission Lines, 545
Regulator, Automatic, for Vulcanisers (Drayton Regulator & Instrument Co., Ltd.), 460*
— Feed-Water, Copes, Trenton Channel Power Station, 500*
— Steam-Pressure, Galloway Heat-Extraction Engine, 318*
Reid, C. R., on Electrically-Heated Trash Screens, Shawinigan Falls Power Plant, 514
Reinforced Concrete. See *Ferro-Concrete*
Relativity and Quantum Theories of Light, 372
Relays, Directional (Everett, Edgcumbe & Co., Ltd.), 60*; (Nalder Brothers & Thompson, Ltd.) 69
— Parmotor Electro-Magnetic, 411*
Remuneration of Labour. See *Labour*
Rengade, Dr. E., Action of Water on Concrete Conduits, 111. See *Erratum*, 202
Repairs, Locomotive, Processing System, Crewe Works, 364*. See 355, 359
— Shops, Locomotive, Transverse or Longitudinal Arrangement, 355. See 358, 362*
— Works, Rolling Stock, London Underground Railways, 645*
Repeated Stresses. See *Alternating Stress* under *Tests (Materials)*
Report on Boiler Failures, 386
— British Non-Ferrous Metals Research Association, 685
— Building Research Board, 238
— Chamber of Shipping, 263
— Commercial, Economic and Financial Conditions, Argentine, 108
— Committee on Industry and Trade, 449, 576
— Creep of Armco Iron, 672
— Cutting Tools Research Committee, on Cutting Temperatures, Discussion, 51
— Economic and Commercial Conditions in Northern Africa, 130
— — Conditions in Paraguay, 804
— — Conditions in United States, 466
— — and Financial Conditions in Germany, 157
— — Situation in Belgium, 610
— Effects of Illumination in Typesetting, 504
— Endurance Tests, Steel-Spring Plates, 419
— Electrical Research Association, 201
— Failure of St. Francis Dam, Los Angeles, 547, 580. See 419*, 452* 644
— Fuel Research Board, Power Alcohol from Vegetable Materials, 78
— Heterogeneity of Steel Ingots, 583. See 600, 632
— Indian Import Trade, 299
— Industrial and Economic Situation in Chile, 548
— 'Iraq Railways, 776
— Kiln-Seasoning of Timber, 348
— National Physical Laboratory, 415
— Natural Lighting of Picture Galleries, 716*
— Panama Canal, 80. See 276, 443
— Penetration of Daylight into Buildings, 401.* See 716*
— Preservation of Niagara Falls, 418*
— Production of Sponge Iron, 361
— Radiant Heating in Buildings, Industrial Fatigue Research Board, 791. See 139
— Royal Commission, Thames Bridges, London, 20
— Safety in Mines Research Board, Work of, 28; Pressures Produced on Blowing Fuses, 715; Pressures Produced by Electric Arcs, 715
— San Francisco Bay Marine Piling Committee, 757*
— Scientific and Industrial Research Department, 218
— Siliceous Abrasives in Canada, 519
— South African Government Railways and Harbours, 402
— Standardised Fan Tests, 357
— Steam Nozzles Research Committee, 107, 109*, 116*, 147*, 207*. See LETTER, 174,
— Trade and Commerce of East Africa, 273
— — and Industries of Australia, 417
— Traffic Advisory Committee, London and Home Counties, 19
— Weight-Carrying by Women, Industrial Fatigue Research Board, 185
— Wigan Seam, Lancashire Coalfield, 414
— Wire Ropes Research, Institution of Mechanical Engineers, 515*, 522*. See 543
— — Ropes, Safety in Mines Research Board, 28, 543. See LETTER, 645
— Working Costs of Diesel Engines in Electric Power Stations, 514. See LETTER, 540. See also 545
— See also *Board of Trade*
Research, Aeronautical, and the Air Estimates, 325
— Association British Non-Ferrous Metals, Report, 685
— — British Silk, Testing Apparatus, 655
— — Electrical, Annual Report, 301
— Board, Building, Annual Report, 238; Investigations of By-Product Aggregates and Pozzuolanas, 120
— — Forest Products, Report on Kiln-Seasoning of Timber, 348
— — Fuel, Report on Power Alcohol from Vegetable Materials, 78; Development of Low-Temperature Carbonisation Processes, 671. See LETTER, 738
— — Industrial Fatigue, Report on Weight-Carrying by Women, 185; Investigations of Effects of Illumination in Typesetting, 504; Report on Radiant Heating in Buildings, 791. See 139; Investigations of Wheel-Barrow Work, 817.
— — Safety in Mines, Report on Work, 28; Report on Wire Ropes, 28, 543. See LETTER, 645; Reports on Pressure Produced by Blowing Fuses and by Arcing in Closed Vessels, 715; Buxton Experimental Station, Investigations of Coal Mining Explosives, 715
— Committee, Cutting Tools, Report on Cutting Temperatures, Discussion, 51
— — Illumination, Report on Penetration of Daylight into Buildings, 401*; Investigations of Effects of Illumination in Typesetting, 504
— Department, Scientific and Industrial, Annual Report, 218; Organisation of Work, 385; Fuel Research, Report on Wigan Seam, Lancashire Coalfield, 414; Endurance Tests of Steel-Spring Plates, 419; Report on Creep of Armco Iron, 672
— — Woolwich, Uses of X-Rays, 175; Exhibits at Royal Society Conversazione, 655
— Illumination, Natural Lighting of Picture Galleries, 716*
— Industrial, Costs and Profits of, 546
— Laboratories, Brown-Firth, Tests of Heat-Resisting Steels, 589, 601, 622, 632
— — Chemical, Teddington, Investigations of Low-Temperature Tar, 611
— Properties of Steam, Progress of American Work, 202
— Scientific, Application to Industry, 643
— — and Electrical Engineering (Review), 286
— Station, Colliery, Buxton, Work of, 28
— — Fuel, Greenwich, Investigations on Reactivity of Coke, 276, 578. See 800
— Steam Nozzles, Report of Committee, 107, 109*, 116*, 147*, 207*. See LETTER, 174
— Viscosity of Lubricating Oils at High Temperatures, 628
— Wire Ropes, Report of Institution of Mechanical Engineers Committee, 515*, 522*. See 543
— — Ropes, Safety in Mines Research Board, 28, 543. See LETTER, 645
— Work, American, Cement Mortars and Concrete, 495
— — and the Development of Engineering, 710
— — Diesel Engines, Admiralty Engineering Laboratory, 407, 425*, 462*
— — H.M. Navy, Pre-War and Present Costs, 687
— — Organisation of, 385
— — Wrought-Iron Chain and Cable Failures, 2*, 515, 618*, 652*. See 741
— See also *National Physical Laboratory*
Reservoirs, Waste Weir Capacities for, 788. See 760
Resistance, Electric. See *Electric*
— Flow of Viscous Liquids through Pipes, Alignment Charts, 498*
— Pyrometer. See *Pyrometer*
— Water, Load Tests of Turbo-Generators, Metropolitan-Vickers Electrical Co., Ltd., 763*
— Welding. See *Welding*
Resistivity, Earth, Measurements, Lake Superior Copper Country, 697

Resonators, Piezo-Electric, Mode of Vibration, 644
Retaining Walls, Concrete, Expansion Joint for, 468*
— — Sheet Piling, Earth Pressure on, 303
— — Sydney Harbour Bridge Approaches, 468*
— — Theories of Earth Pressure on, 674
Retorts, Gas, Steam Generation by Waste Heat, 242*, 272. See 233, 265
— Settings, Gas, Heat Insulation of, 800
— Vertical, Dvorkovitz Low-Temperature Carbonisation System, 72*
Reviews. See LITERATURE INDEX
Reyrolle, A., & Co., Ltd., Exhibits at British Industries Fair, 206*; Automatic Control, Motor-Converter Substations, 649*
Rheinfelden Hydro-Electric Power Station, Reconstruction, 494
Rheostats, Field, Standard Specification, 306
Rhodesia, Northern, Trade of, Report, 273
Ricardo, H. R., on Light High-Speed Internal-Combustion Engines, 751. See 727
Richardson, Sir A., the Late, 411
Richardson, E. A., on Steel for Aircraft Construction, 695
Richmond, Lieut.-Col. V. C., on Airship Construction, 457*. See 325, 437
Richter & Pickts, Weserhütte Cable-Laying Machine, 781*
Rieseler Change-Speed Gear, 444*
Rifle Cartridge Cases, Season Cracking of, 304*, 312
Rigid Airships. See *Airships* under *Aeronautics*
Rings, Angle, Bending Machine for, 256
— Piston. See *Piston Rings*
Rio de Janeiro, Aerial Survey of, 486
River Agua Fria, Arizona, Multiple-Arch Dam, 159*
— Clyde Falls, Bonnington and Stonebyres Power Stations, 767*, 791*
— Congo, Proposed Water-Power Development, 685
— Detroit, Suspension Bridge over, 357
— Gauging Flow of (Review), 564
— Illinois, Poliution and Self-Purification, 544
— Pollution, Oxygen-Demand Test, 544
— — and Water Supply, Research, 218
— Severn, Tidal-Power Scheme, 759, 785
— Silting and Scouring in, New Theory, 307*
— St. Lawrence, Improvement for Navigation and Power Production, 62* 114* 125*, 137
— — Port of Quebec, 183*
— Thames, Charing Cross Bridge, Ministry of Transport Proposals, 513, 609. See LETTER, 738
— — Deep-Water Jetty at Northfleet, 445
— — London, Floods from Tidal Wave, 48, 77, 294. See LETTER, 74
— Tidal and Non-Tidal, Pollution of, 612
— Tweed, Berwick, Ferro-Concrete Road Bridge, 527*, 615*
— Tyne, Steel Arch Bridge, Newcastle, Erection of, 266*
— Volga and Don, Linking up, 715
— Yangtse, Shallow-Draught Gunboats, 333*
Riveting Machine, High-Speed, for Cold Rivets, 282*
Road Construction in Canada, 419
— — Gauges for Broken Stone and Chippings, Standard Specification, 666
— — Modern Requirements, 726, 750
— Improvements, London District, Progress with, 19
— — Northern Africa, 130
— Locomotives. See *Motor*; *Tractor*
— Paving Bricks, Tests of, 96
— Roller, Diesel-Engine Driven (J. Kemna), 285*
— — with Steam-Operated Scarifier, 284*
— Traffic Requirements, Liverpool, 635
— — Statistics, 726, 750
— Transport, Carbon Bisulphide, Proposed Regulations, 669
— — and the Railway Companies, 203
— — Competition with Railways in South Africa, 403
Roadmaker Concrete Mixer, 475*
Roadside Petrol Pumps, Filter Nozzle for, 212*
Roberts, D., the Late, 511
Robey & Co., Ltd., Horizontal Solid-Injection Oil Engine, 226*
Robinson, T., & Son, Ltd., Six-Roller High-Speed Planing and Moulding Machine for Hardwoods, 130*; Woodworking Machinery at Building Exhibition, 476*
Robinson, T. W., on the American Iron and Steel Industry, 467
Robson, G., & Co., Conveyors and Chutes for Mails, Post Office Tube Railway, 311*
"Rodney" H.M.S., Turbo-Generators, 375*
Roll-Grinding Machine (Naxos Union), 282*
Roller Bearings. See *Bearings*
— Road. See *Road Rolls*.
Rolling Mills, Appleby Iron Co., Ltd., 552*, 587*
— — Backed-Up Type, for Cold Rolling Nickel Sheets, 696
— Steel Tubes, Mannesmann Process, Investigations, 269*
— Stock, Railway, Grinding Machine for, Axle Journals, 637*
— — London Underground Railways, Acton Overhaul Works, 645*
— — Railway, Wear of Paints, on, 779
— — See also *Carriages*; *Locomotives*; *Wagons*
"Romanus," Italian Floating Crane for Concrete Blocks, 247*
Romero, L., on Distribution of Electricity in Cities and Towns, 737
Röntgen Ray Apparatus, Physical and Optical Societies' Exhibition, 102. See 175
— — Investigations of Welds, 777
— — Technical Uses, Work of Woolwich Research Department, 175
Roof Cranes, Level-Luffing Type, Avonmouth Docks, 567*, 591
Roper, D. W., on 132,000-volt Cables, 177*
Ropes, Wire. See *Wire Ropes*
Rosencrants, F. H., on Boiler Plant Progress, 323; on Progress in Coal Combustion for Steam Generation, 742
Rosenhain, Dr. W., on the Equilibrium Diagram, 296; Contact-Resistance Type Electric Furnace, 655
Rotary Converters, Performance of, Standard Specification, 235
— Engine. See *Engine*; *Aeronautics*
— Pump. See *Pump*
Rothamsted Experimental Station, Traction Dynamometer for Ploughing, 538*; Analysis of Thermometer Observations, 540; Investigations of Nitrogenous Fertilisers, 643
Rotors, Electrical Machinery, Moments of Inertia, Experimental Determination, 213* See LETTER, 614
— Turbine, Dynamic Balancing Machine for, Metropolitan-Vickers Electrical Co., Ltd., 657*
Rotterdam Lloyd Royal Mail Line, Davits for Motor Ships, 505*. See 541
Rotterdam Lloyd Steamship Company, Diesel Engines for M.S. "Sibajak," 71*
Rowell, H. S., on Viscosity of Lubricating Oils at High Temperatures, 628
Rowney, W. J., on Earth-Resistivity Measurements, 697
Royal Aeronautical Society. See *Aeronautical*
— Air Force, Education in, 263; Estimated Expenditure, 325
— Agricultural Hall. See *Exhibition*
— Colonial Institute. The Organisation of Research, by H. T. Tizard, 385
— Commission, Report on Thames Bridges, London, 20
— Edward Dock, Avonmouth, Extension of, 565*, 591*. See 644

Royal Institution:

Petroleum Natural Gases and their Derivatives, by J. Kewley, 63
Explosion of Bitumen-Laid Cable, 80
Dielectrics for Electrical Condensers, by P. R. Coursey, 133
Science and the Work of the Engineer, by Prof. Andrade, 160. See LETTER, 227.
Relations between Light and Electricity, by Sir W. Bragg, 201
Faraday's Notebooks, by Sir W. Bragg, 235
Transformation of Matter, by Sir E. Rutherford, 315*, 360*, 387*, 422*
Quantum and Relativity Theories of Light, by Prof. E. T. Whittaker, 372
Carriers of Electricity in the Atmosphere, by Prof. A. M. Tyndall, 546
Engine Knock and Related Problems, by A. C. Egerton, 673. See *Errata*, 713

Royal Mail Steam Packet Meat Transports, Ltd., Salvage of S.S. "Nagara," 163*
— Meteorological Society. See *Meteorological*
— Scholarships and Free Studentships, Syllabus, 804
— Society, Conversazione and Exhibition of Instruments and Apparatus, 643, 655*, 779
— Society of Arts. See *Arts*
— Technical College, Glasgow, Experiments on Turbine-Wheel Friction, 296
— Tweed Bridge, Berwick, 527*, 615*
Rubber Hoses, Quick-Fastening Clip for, 29*
— Joint, Billé, Ferro-Concrete Water Pipes, 803*
— Models, Investigation of Stresses in Dams, Wilson and Gore's Experiments, 709
— Vulcanisers, Automatic Regulator for, 460*
Rules and Tables, British Corporation Register of Shipping and Aircraft, 738
Rural Areas, Distribution of Electricity, 737
Russell, Sir J., on Nitrogenous Fertilisers, 643
Russia, Commercial Aviation in, 172
— Linking up Rivers Don and Volga, 715
— Trade with United States, 432
Russian Railways, Diesel-Engine Locomotive Trials, 504
Rusting. See *Corrosion*
Rutherford, Sir E., on the Transformation of Matter, 315*, 360*, 387*, 422*

S.

SACRAMENTO Northern Railroad, Electric Locomotives for, 664
Safety, Factors of, in Boiler Practice, 386
— in Mines Research Board, Report on Work, 28; Report on Wire Ropes, 28, 543. See LETTER, 645; Buxton Experimental Station, Investigations of Coal-Mining Explosives, 715; Reports on Pressure Produced by Blowing Fuses and by Arcing in Closed Vessels, 715
— Precautions, Economic Value of, 77
Sagar, J., & Co., Ltd., Woodworking Machinery at Building Exhibition, 508*
Saint. See *St.*
Sales Organisation, Engineering Trade, 778
Salter, G., & Co., Ltd., 100-ton Spring Balance for Cranes, 256*
Saltley Sewage Works, Power Production from Sludge Gas, 162
Salvage Operations, Ex-German Battle Cruiser "Moltke," 737*
— S.S. "Nagara," Ferro-Concrete Patch, 163*
Sampling Dust in Mines, Impinger-Plate Method, 290
San Francisco Bay, Destruction of Timber Piling by Marine-Boring Organisms, 757*
Sand Preparing Plant, Foundry, Metropolitan-Vickers Electrical Co., Ltd., 67
Sanding Machine. See *Machine Tools*
Sandstone Quarrying for Grindstone Manufacture, 519
Sanitation, Motor Refuse-Collecting Cart with Screw Conveyor, 556*
Saving, National, and Engineering Export Trade, 484
Saws. See *Machine Tools*
Sawin, Prof. N. N., on Limit Systems, 373*
Scale, Boiler, Heat Conductivity of, 777
— Formation and Tube Failures, High-Pressure Boilers, Lakeside Power Station, 25*, 55*
Scarifier, Steam-Operated, Road Roller with, 284*
Schelde-Sulzer Diesel Engines, M.S. "Sibajak," 71*
Schering Bridge, Cambridge Direct-Reading Type, 50*
— Vibration Galvanometer, 101*
Schiege Concrete Mixer, 285*
Schiess-Defries A.-G., High-Speed Lathe, 283*
Schneider Trophy Race, Napier-Lion Aero Engine for, 632*
Schofield, F. H., on Conductivity of Aluminium Alloys and Bronzes, 301*. See 312
Scholarship. See *Education*
Schuchardt & Schütte A.-G., Grinding Machine, 326
Schultz, H. C., on Liquid Oxygen for Blasting, 818
Schumann A.-G., Koswa Stop Valve for Superheated Steam, 327*
Schwab, C. M., Presentation of Bessemer Medal to, 577
Science, Application to Industry, 643
— and Engineering, Relationship, 169. See LETTER, 227
— Museum, South Kensington, New Galleries, 356. See LETTER, 382
— — South Kensington, Treatment of Officers, 382
— Natural, and Technology, 779
— Scholarship, Examination Syllabus, 606
Scientific Apparatus, Physical and Optical Societies' Exhibition, 49*, 68*, 101*. See 142, 175, 237*, 400*
— Royal Society Conversazione, 643, 655*, 779
— Invention and the Development of Engineering, 709, 755. See 707
— Management. See *Works Management*
— Research. See *Research*
— Societies. See *Institutions*
Scleroscope Tests. See *Hardness* under *Tests* (*Materials*)
Scobie, Dr. W. A., Report on Wire Ropes Research, 522*. See 515*, 543
Scotland Lanarkshire Hydro-Electric Power Co., Ltd., Water Power Plants, 767*, 791*
Scouring and Silting in Channels, New Theory, 307*
Scrap Metal, Contamination of, 696
Screens, Inclined - Travelling, Circulating Water, Trenton Channel Power Station, 690*
— Trash, Electrically-Heated, Shawinigan Falls Power Plant, 514
Screw Conveyor on Refuse-Collecting Cart, 556*
—Cutting Lathe. See *Lathe* under *Machine Tools*
— Propellers. See *Propellers*; *Aeronautics*
— Threads, Canadian Standard, and British Electrical Fittings, 230
Sea-Water Corrosion, Metals and Alloys, 314
— — Corrosion, Over Stressed Iron and Steel, 630
— Wall, San Francisco Bay, Protection against Marine Boring Organisms, 757*
"Seamew," Shallow-Draught Gunboat, 333
Seamless Steel Tubes, Manufacture by Mannesmann Process, 269*
Seaplanes. See *Aeronautics*
Season Cracking of Cartridge Cases, 304*, 312
Seasoning, Kiln, of Timber, Report, 318
Secondary Battery. See *Accumulator* under *Electric*; *Motor Truck*
— Stresses in Bridge Design, 261. See *Erratum*, 290
Sediment Blowing-Off Device for Boilers, 256*
Seewer Governing Gear, Pelton Wheels, Bhira Power Station, 771*. See 747*
Segregation in Steel Ingots, Report on, 583. See 600, 632
Selenium Films, Production by Bubble Blowing, 572
Self-Induction. See *Electric*
Sellon, R. P., the Late, 113
Semi-Portable Engine. See *Engine*
Semper, C., Wire-Forming Machine, 282*
Sensitive Drill. See *Drill* under *Machine Tool*
Separating Dust from Flue Gases, Induced-Draught Fan for, 428*
Separator, Magnetic, for Liquids, 284*
— — Recovery of Non-Ferrous Scrap from Turnings, 122*
"Serrano," Chilean Destroyer, Launch of, 111. See 638
Sevenoaks Railway Accident, Report, 138
Severn Tidal Power Scheme, 759, 785
Sewage, Chicago, Pollution and Self-Purification of River Illinois, 514
— Disposal, Activated - Sludge Process (Review), 603
— Sludge, Power Production from Gas, 162
— System, Chicago, and the Great Lakes, 126*. See 62*, 114*, 137
— Tanks, Comparisons of Types, 760, 789
— See also PARAGRAPH INDEX
Sewerage, Manchester, Rainfall and Run-Off Ground, 760, 789*
Sextant, Superstellar, Huson, 103
Shafts for Deep Mines, 759, 787
—Grinding Machine, Churchill, Metropolitan-Vickers Electrical Co., Ltd., 731*
— and Holes, Fitting of. See *Gauges*; *Gauging*
— Sinking, Treatise on (Review), 528
Shale, Oils from, Comparisons with Oil from Coal, 9
Shallow-Draught Gunboats for the Yangste-Kiang, 333*
Shanghai Electric Power Station, Extensions, 685. See 805
Shaw, C. H., on 132,000-volt Cables, 177*
Shaw, Captain H., on Gravity Surveying in Great Britain, 697
Shaw, Savill and Albion Line, M.S. "Zealandic," 525*
Shawinigan Falls Power Plant, Electrically-Heated Trash Screens, 514
Shearing Machine. See *Machine Tools*
Sheds and Piers, Port of Boston, 34*, 97*
— Transit, Ferro-Concrete, Avonmouth Docks, 569*. See 591*
Sheet Iron, Electrolytic Manufacture, 339*
— Metal Shops, Metropolitan-Vickers Electrical Co., Ltd., 280*
— Piling, Earth Pressure on, 303
Ships, Bending and Loading of, 391, 393*
— Boats, Vreugdenhil Listproof Davits, 505*. See 541
— — Welin-Maclachlan Davits for, S.S. "Duchess of Bedford," 675*
— Canal. See *Canal*; *Navigation, Inland*
— under Construction, Lloyd's Statistics, 48, 484
— Diesel-Engined. See *Motor Ships*; *Marine Propulsion*
— Increase in Dimensions of, 725, 749*
— Launched, Annual Statistics, 148
— Merchant, Design and Cost of (Review), 34
— Motor. See *Motor Ships*; *Marine Propulsion*
— Passenger, Design of Superstructures, 54
— Propellers. See *Propellers*
— Propulsion. See *Marine Propulsion*; *Engines*; *Turbines*; *Propellers*
— Salvage of. See *Salvage*
— Surveyors and Consulting Marine Engineers, Society of. See *Consulting Marine Engineers*
— Vibration of, Causes, 199. See LETTER, 227
— See also *Marine*; *Motor Ships*; *Shipping*; *Steamers*; *Warships*; and PARAGRAPH INDEX

Shipbuilders and Engineers, North-East Coast Institution of. See *North-East Coast*

Shipbuilding, Bending Experiments, H.M.S. "Wolf," Effective Moment of Inertia, 410
— — and Loading of Ships, 391, 393*
— British Corporation Rules and Tables, 738
— Design and Cost Estimating (Review), 34
— — of Superstructure, Passenger Ships, 54
— Dimensions of Vessels, 725, 749*
— High-Tensile Steel for, 700, 720
— Industry, Dantzig, 811
— — and Need for National Economy, 389
— — Position and Prospects, 357, 389.
— Naval. See *Warships*
— Railway-Wagon Floats, Strength and Deflection of Hulls, 54
— Relative Strength, Fine and Full-Form Cargo Vessels, 408
— Small Oil-Engined Vessels (Review), 173
— Use of Victaulic Pipe Joints, 772
— Vessels under Construction, Lloyd's Statistics, 48, 484
— — Launched, Annual Statistics, 148
— Vibration of Ships, Causes, 199. See LETTER, 227
— See also *Steamers*; *Naval*; *Warships*; and PARAGRAPH INDEX

Shipping and Aircraft, British Corporation, Register of, Rules and Tables, 738 See 257
— Board, United States, Conversion Programme, Diesel Engines for, 88
— Chamber of, Annual Report, 263
— Classification of, Work of British Corporation, 257 See 738
— Dimensions of Vessels, 725, 749*
— Industry, Economic Position, 263
— Ocean Transport in International Trade, 635
— State Ownership of, 264
— Statistical Analysis of Voyage Abstracts, 440
— Vessels under Construction, Lloyd's Statistics, 48, 484
— — Lost, 372
— Western Ports of North Atlantic, Boston, 34*, 97*; Quebec, 183*

Shire, L. G. W., on Pneumatic Tyres for Motor Omnibuses, 18. See LETTER, 351
Shock Tests. See *Impact Tests* under *Tests* (*Materials*)
Shop Management. See *Works Management*
Shore, H., on Viscosity of Lubricating Oils, 281
Shore Scleroscope Tests. See *Hardness* under *Tests* (*Materials*)
Short-Singapore Seaplane, Flight Round Africa, 740
Show. See *Exhibition*
Shrinkage, Concrete, Effect on Stress Distribution, Ferro-Concrete Columns, 515
Shropshire, Worcestershire & Staffordshire Power Co., Ltd., Stourport Power Station, Coal-Handling Plant, 11*; 5,000-kw. Frequency Changer, 144
Shunting Locomotive, Oil-Engine Driven (Berliner Maschinenbau A.G.), 285*
— — Petrol, Alsop-en-le-Dale Quarries, 8*
Shuttering, Steel, for Ferro-Concrete Construction, 569*, 570
"Sibajak," M.S., Schelde-Sulzer Diesel Engines, 71*
Siemens, A., the Late, 231*
Siemens and General Electric Signalling Co., Ltd., Train-Control and Automatic Signalling Apparatus, Post Office Railway, 154*
Siemens-Martin Furnaces. See *Furnaces*
Siemens-Schuckert Werke, Exhibits at Leipzig Fair, 328*
Signalling, Automatic, Post Office Tube Railway, 154*
Silica Coke Oven and Machinery, Ltd., Coke-Oven Plant, Consett Iron Co., 165
— Refractory Materials, Firing with Oil Fuel, 336*
Siliceous Abrasives in Canada, Report, 519
Silicon-Aluminium-Iron Alloys, Constitution of, 179*, 210*
— Influence on Tungsten Magnet Steel, 554*, 600, 632
Silos, Ferro-Concrete, Avonmouth Docks, 571*, 594*
— Grain, Port of Boston, 100; Port of Quebec, 183*
Silk-Testing Apparatus, British Silk Research Association, 655
Silting and Scouring in Channels, Theory, 307*
Siluminite Insulator Co., Ltd., Exhibits at British Industries Fair, 253
Silver, Standard, Effect of Heat Treatment, 314
Simon, H., Ltd., Grain-Handling Machinery, Avonmouth Docks, 591*
Simpson, M. G., on the Indo-European Telegraph Department, 209*
Sinclair, Col. A., on Administration of Electricity-Supply Undertakings, 737
Singapore Naval Base, Floating Dock for, 84*
Single-Phase. See *Generator*; *Motor*; *Locomotive*; *Power*; *Railway*

Singleton, W., Analysis of Opal Glass, 487
Sinnatt, F. S., on Reactivity of Coke, 578
Sir John Cass Institute, Lectures on Fuel, 174
Skewbacks, Concrete, Sydney Harbour Bridge, 470*. See 559
Skoda Works, Investigations of Limit Systems, 373*
Slag as Concrete Aggregate, Investigations, 120
— See also *Metallurgy*
Sludge, Oil Refining, Disposal of, 818
— See also *Sewage*
Small-Arms Cartridge Cases, Season Cracking of, 304*, 312
Smelting Furnaces. See *Furnaces*
Smith, A., the Late, 44
Smith, H. C., on Gas Distribution at Tottenham, 769
Smith, R. T., on Swiss Railway Electrification, 481
Smith, S., & Blyth, Ltd., Paint Mill, 475*
Smiths' Shops, Metropolitan-Vickers Electrical Co., Ltd., 124*
Smokeless Fuel. See *Coal, Low Temperature Carbonisation*
Soaking Pits, Appleby Iron Co.'s Works, 587
Society of Motor Manufacturers and Traders. See *Motor*
Societies, Technical and Scientific. See *Institutions*
— Trade. See *Labour*
Sodium-Peroxide Bomb Calorimeter, 623*
— Phosphate, Feed-Water Treatment for High-Pressure Boilers, 55*
Soft Metals, Cold-Worked, Hardness of, 313
Softener, Water. See *Water Softener*
Solar Constant, Determination of, 612
Soldering-Iron Heater, Surface-Combustion Type, 221*
— Joints, Lead-Sheathed Cables, Automatic Plumber for, 254*
Solders, Surface Tension of, 212
Sound Recording and Reproducing Apparatus, Gramophone, Progress with, 400*
— Transmission through Building Materials, 368
Sounding Gear, Echo, Improved Form, 103
South Africa, Compressing Plant for Natural Carbon Dioxide, Bongwan, Natal, 46
— African Government Railways and Harbours, Report, 402
— — Railways and Motor Transport, Competition, 403
— — Railways, Pietermaritzburg-Glencoe Section, Electrification, 650*, 679*. See 402, 481
— East England Electricity Scheme, 17, 230
— Kensington, Science Museum, New Galleries, 356. See LETTER, 382
— — Science Museum, Treatment of Officers, 382
— Persian Oilfield, Utilisation of Natural Gas, 341
— West, Notes from, 15, 45, 75, 105, 134, 166, 197, 235, 258, 291, 321, 353, 382, 415, 446, 478, 510, 541, 573, 607, 639, 669, 705, 739, 773, 805. See PARAGRAPH INDEX
— Yorkshire, Notes from, 14, 44, 74, 105, 135, 166, 196, 235, 258, 291, 321, 353, 382, 414, 447, 479, 450, 541, 573, 607, 639, 669, 705, 739, 773, 805. See PARAGRAPH INDEX
Southern Railway, Accidents at Sevenoaks and Bearsted, Reports, 138; Electrification of, 481; Charing Cross Station, Proposed Removal, 513, 609. See 738
Southampton Meeting, Institution of Mechanical Engineers. See *Mechanical Engineers*
— Port of, Development, 800*, 809
— Use as Air Port, 809
Soviet Russia, Linking up Rivers Volga and Don, 715
— — Trade with United States, 432
Spear, L. Y., on Submarines, 54
Specifications, Standard. See *Standard; Standardisation*
Spectrographs, Hilger, at Physical and Optical Societies' Exhibition, 49
Spectroscopy, Treatise on (Review), 371
Spectrum Lines, Estimating Intensity of, 486
Speed-Reduction Gears. See *Gears; Gearing; Marine Propulsion; Motor-Car Details*
— Regulation. See *Governing*
— Trials. See *Trials*
Spelter Prices. See *Metal-Price Diagrams*
Spencer (Melksham), Ltd., Conveyors and Elevators Post Office Tube Railway, 311*
Spiral Chutes for Mails, Post Office Tube Railway, 312*
Spirit, Motor. See *Motor Fuels*
Sponge Iron, Production of, Report, 361
Sprague, W., on Model Propellers Working in Air and Water, 409
Spring Balance, 100-ton, for Cranes, 256*
— Fuel-Injection System, Davey-Paxman Oil Engine, 225*
— Helical, Avoiding Permanent Set, 711*
— Laminated, Endurance Tests of Steel Plates, 419
— — 200-ton Press for Finishing, 283*
Spur Gearing. See *Gears; Gearing; Marine Propulsion*
St. Francis Dam, Los Angeles, Failure of, 419*, 452*, 547, 580, 644
St. John del Rey Mining Co., Ltd., Morro Velho Mine, Mining Methods, 379
St. Lawrence River, Improvement for Navigation and Power Production, 62*, 114*, 125*, 137; Port of Quebec, 183*
St. Pancras Power Station, Extensions, 22
Stainless Steel, Autogenous Welding of, 478
Stair Strings, Recessing Machine for, 508*
Stamp, Sir J. C., on Industrial Co-Operation, 636
Stamping Hammers and Presses. See *Machine Tools*
— Plant, Laminations, Electrical Machinery, Metropolitan-Vickers Electrical Co., Ltd., 186*
Standard Construction Methods (Review), 780
— Corrosion Tests, 80
— Pipe-Flange Tables, 715
— Screw Threads, Canadian, and British Electrical Fittings, 230
Standard Electrical Code, Canadian, and British Electrical Fittings, 230
— Silver, Effect of Heat Treatment, 314
— Specifications, Two-Pin Wall Plugs and Sockets, 59, 257; Drawing-Office Practice, 146; Steel Bars for Machined Parts, 185; Tubular Tramway Poles, 228; Performance of Rotary Converters, 235; Malleable-Iron Castings, 276; Field Rheostats, 306; Bolt Heads, Nuts and Washers, 308; Steel Fishplates, 340; Illumination Glassware, 400; Translucent Glassware Illumination Fittings, 400; Index to, 429; Grey-Iron Castings, 480; Colliery Materials, 579; Electric Power Switchboards, 494; Tramway Trackwork, 623; Gauges of Broken Stone and Chippings, 666; Paints and Varnishes, 756, 803; Fire-Hose Couplings, 813
— Thermal Efficiency, Internal-Combustion Engines, 10
— Tolerances, Reamer Diameters, 729
— Association. See *Engineering Standards*
— United States Bureau of. See *United States*
Standardisation and Simplified Practice, Manufactured Goods, 324
Standardised Fan Tests, Report, 357
Starkie, D., on Ultra-Violet Ray Transmission through Glass, 487
Starters, Motor. See *Motors, Electric*
State Control, Water Power, United States, Criticisms of Proposals, 642
— Ownership of Shipping, 264
— Railways. See *Railways*
Stations, Power. See *Power Stations*
Statistics, Trade. See *Trade*
Steam Boats. See *Steamers*
— Boilers. See *Boilers*
— De-Superheater for, Automatic Control, Crosby, 275*
— Engines. See *Engines*
— Flow through Nozzles. See *Nozzles*
— Generation by Waste Heat, Steel Works, Gas Works, and Marine Oil Engines, 233, 241*, 264, 272
— Hammer. See *Hammer* under *Machine Tools*
— Heating, Automatic Temperature-Control Apparatus, Crosby, 273*
— — Supply from Uniflow Heat-Extraction Engine, 318*
— — of Vulcanisers, Automatic Regulator, 460*
— High-Pressure, and the Development of Steam Turbines, 727, 728, 752, 753*
— — Pressure, for Marine Propulsion, 701, 721
— — Pressure, Operating Experiences, Lakeside Power Station, 25*, 55*
— — Pressure, Propelling Machinery, S.S. "King George V," Results, 379. See 390
— — Pressure, Use on Locomotives, 103
— Pile-Driving Hammer, Menck, 491*
— Pipe, Cast-Iron, Explosion at Colliery, 518
— — Copper, Failure on S.S. "Egyptian Transport," 518
— Piping System, Trenton Channel Power Station, 535*
— Pressure Regulator, Galloway Heat-Extraction Engine, 318*
— Properties of, Progress of American Research, 202
— Roller. See *Road Roller*
— Shovel. See *Excavating Machine*
— Superheater. See *Superheater*
— Tractors. See *Tractors*
— Trials. See *Trials*
— Turbines. See *Turbines*
— Users' Association. See *Manchester*
Steamer "Bellview," Stop-Valve Explosion, 518
— "Britannia," Bauer-Wach Exhaust-Turbine Drive, 206
— Cargo, Fine and Full Form, Relative Strength, 408
— "City of Roubaix," Ellerman Line, 175
— under Construction, Lloyd's Statistics, 48, 484
— "Dee Why" and "Curl Curl," Double-Ended Screws, Sydney Harbour, 399*, 408
— "Duchess of Bedford," Canadian Pacific Railway Co., 675*. See 711
— Early American, with Geared Reciprocating Engines, 54
— — American, on Lake Champlain, 549
— "Egyptian Transport," Failure of Copper Steam Pipe, 518
— "Empirestar," Explosion of Stop-Valve Chest, 518
— Fuel for, Comparisons of Coal and Oil, 378*, 389, 430*
— Geared Turbines for. See *Marine Propulsion*
— Increase in Dimensions of, 725, 740*
— "King George V" High-Pressure Turbines, Results, 379. See 390; Boiler Explosion, 352
— Launched, Annual Statistics, 148
— Loss of Speed in Service, 440
— Lost, Lloyd's Statistics, 372
— Merchant, Design and Cost of (Review), 34
— "Montclare," Explosion of Feed-Water Heater, 518
— "Nagara," Salvage by Ferro-Concrete Patch, 163*
— Oil Tank, Fires and Explosions on, 87
— "Oroya" and "Oropesa," Cavitation and Propulsive Efficiency, 439
— Passenger, Design of Superstructures, 54
— Propulsion of. See *Marine Propulsion; Engines; Turbines; Propellers*
— Salvage of. See *Salvage*
— Statistical Analysis of Voyage Abstracts, 440
— Stranded, Optical Investigation of Stresses, 409, 427*
— Vibration of, Causes, 199. See LETTER, 227
— See also *Engines; Marine Propulsion; Shipbuilding; Shipping; Ships; Turbines; Warships*; PARAGRAPH INDEX
Steamships. See *Ships; Steamers; Warships*
Steel for Aircraft Construction, 695
— Bars for Machined Parts, Standard Specification, 185
— Boiler and Superheater Construction, Strength at High Temperatures, 702, 723. See 728
Steel, Case-Hardening of. See *Heat Treatment* under *Metallurgy*
— Chain Links, Brittleness of, Effects of Proofing and Annealing, 2*. See also 515, 618*, 652*, 741
— Chromium, Rails and Fishplates, Behaviour in Service, 602, 617, 632
— — See also *Steel, Stainless*
— Corrosion. See *Corrosion*
— Detection of Strain by Etching, 79
— Fatigue of. See *Alternating Stress* under *Tests (Materials)*
— Framed Buildings Corrosion and Life, 433
— — Buildings, Wind Stresses, 625*
— Foundry. See *Foundry*
— Furnaces. See *Furnaces*
— Heat-Resisting, Mechanical Properties at High Temperatures, 589, 601, 622, 632
— — Treatment of. See *Heat Treatment* under *Metallurgy*
— High-Speed, Eclipse Hack-Saw Blades, 639
— — Tensile, for Shipbuilding, 720. See 700
— Industry, Report of Committee on Industry and Trade, 576
— — United States, Economic and Social Development, 467
— Ingots, Report on Heterogeneity, 583. See 600, 632
— and Iron Manufacturers, National Federation of, Annual Dinner, 674
— Making Plant, Crewe Locomotive Works, 365*
— Manufacture. See *Metallurgy*
— Microstructure of. See *Microphotographs; Metallography*
— Nickel-Chromium, Unusual Fracture in Tensile Test, 55*
— — Properties of, Influence of Manganese, 579, 632
— Over-Stressed, Corrosion in Sea Water, 630
— — Strained, Rapid Normalising by Electric Current, 632, 682*
— Plates, Prices. See *Metal-Price Diagrams*
— — for Springs, Endurance Tests, 419
— and Power Show, Toronto, British Participation, 482, 612
— Rails. See *Rails; Metal-Price Diagrams*
— for Railway Work, 695
— Rolling Mills. See *Rolling Mills*
— Ropes. See *Wire Ropes*
— Shuttering, Use for Ferro-Concrete Construction, 569*, 570
— Special, Historical Exhibits, Institution of Civil Engineers' Conversazione, 709
— — for Railway Construction, 700, 720. See *Erratum*, 739
— Stainless, Autogenous Welding of, 478
— Stress Distribution in. See *Stress; Tests (Materials)*
— Tests of. See *Tests (Materials)*
— Trucks (Metallisation, Ltd.), 256
— Tubes, Manufacture, Mannesmann Process, Investigations, 269*
— Tungsten Magnet, Influence of Silicon, 554*, 600, 632
— Works. See *Works*
Steelwork, Structural, Corrosion and Life of Steel-Framed Buildings, 433
Steering Gear, Electro-Hydraulic, S.S. "Duchess of Bedford," 676*
Stephenson Memorial, Institution of Mechanical Engineers, Unveiling of, 290, 358
Stereoscope, History of, 494
Stereoscopic Vision, Experiments on, 644
Stiffening Girders, Suspension Bridges, Stresses, in, 1
Stilgoe, H. E., on Water for Domestic Purposes, 787*. See 760
Still, Marine Oil Engine, Comparisons with Doxford Engine, 39. See 47
Stirling Boilers, Trenton Channel Power Station, 499*, 532*
Stokers, Mechanical, Electrically-Driven, Starting and Control Gear, 85*. See 145*
— — for Marine Boilers, Comparisons, 378, 430*. See 389
Stone, Broken, and Chippings, Gauges of, Standard Specification, 666
— Building, Weathering of, 239
Stonebyres Power Station, Lanarkshire Hydro-Electric Power Co., Ltd., 767*, 791*
Stop Valves. See *Valves*
Storage Battery. See *Accumulator* under *Electric; Motor Truck*
Stores Organisation, Metropolitan-Vickers Electrical Co., Ltd., 189*
Stothert & Pitt, Ltd., Level-Luffing Roof Cranes, Avonmouth Docks, 567*, 591
Stourport Power Station, Coal-Handling Plant, 11*; 6,000-kw. Frequency Changer, 144
Strain in Steel, Detection by Etching, 79
— See also *Stress*
Strainers, Inclined Travelling, Circulating Water, Trenton Channel Power Station, 690*
Stranded Vessels, Stresses in, Optical Investigations, 409, 427*
Stratified Minerals, Working of (Review), 346
Straw, Production of Alcohol from, 78
Streams, Gauging Flow of (Review), 564
Stream-Line Filter for Oily Bilge Water, Japanese Navy, 150*
Street Railway. See *Tramways*
— See *Roads*
Strength of Materials. See *Stress* and *Tests (Materials)*
Stress, Compressive, Concrete Flow under, 495
— Alternating and Combined. See *Tests (Materials)*
— Creep, Limiting, Steel for Boiler and Superheater Construction, 723. See 703, 728
— Distribution, Ferro-Concrete Columns, Effect of Concrete Shrinkage, 515
— Optical Determination of. See *Optical*
— Recorder, Cambridge, Use with Traction Dynamometer, 538*
— Repetitions. See *Alternating Stress* under *Tests (Materials)*
— in Arch Bridges, Optical Determination, Apparatus for, 810*. See 709
— in Dams, Investigation by Rubber Models, Wilson and Gore's Experiments, 709
Stress, Secondary, in Bridge Design, 261. See *Erratum*, 290
— in Stiffening Girders, Suspension Bridges, 1
— in Stranded Vessels, Optical Investigations, 409, 427*
— Thermal, in Boiler Plates, 777
— Wind, in Tall Steel-Framed Buildings, 625*
Strikes. See *Labour*
Stromeyer, C. E., Report on Boiler Failures, 386
Stroyer, R. N., on Earth Pressure on Flexible Walls, 303
Structural Design, Secondary Stresses in, 261. See *Erratum*, 290
— — Wind Stresses in Steel-Framed Buildings, 625*
— Engineering Industry, Position and Prospects, 388
— Engineers, Institution of, Manual on Training, 202; Annual Dinner, 392; Theories of Earth Pressure, by Col. J. M. Moncrieff, 674
— Members, Sydney Harbour Bridge, Tests of Models, 697*
— Steelwork. See *Steelwork*
Structures, Marine, Timber, San Francisco Bay, Destruction by Boring Organisms, 757*
— Engineering, Recent Developments in, 699, 719
— Ferro-Concrete. See *Ferro-Concrete*
— Stresses in Arch Bridges, Optical Determination, 810*. See 709
Struts. See *Columns*
Submarine Boats. See *Warships*
— Telegraphs. See *Telegraphs*
Substations, Automatic, Motor Converters, Brighton District, 649*
— Equipment, Post Office Tube Railway, 153*
— South African Railway Electrification, 651*. See 402
— Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd., 816
Suction Dredger. See *Dredger*
— Gas Engine. See *Engine, Gas*
— — Producer. See *Producer*
Sullivan-Griffiths Precision Variable Air Condenser, 237*
Sulphur-Dioxide Compressors, Refrigerating Plant (R. Boby, Ltd.), 226*
Sulphuretted Hydrogen, Physiological Effects, 349
Sulphuric Acid, Use for Alumina Extraction, 375
Sulzer Bros., 7,000-h.p. Diesel Engines, 412*
— Type Diesel Engines, M.S. "Sibajak," 71*; M.S. "Zealandic," 525*
Sump-Draining Pump, Penberthy Automatic, 509*
Sunlight Penetration into Buildings, 401*. See 716*
Sun's Cycle of Activity, 455
Supercharging in Marine Diesel Engines, 41, 426. See 407, 462
Superheater, "Express" Boiler, 303*
— Independently-Fired, Test Department Metropolitan-Vickers Electrical Co., Ltd., 761*
— Locomotive. See *Locomotive*
— Stirling Boilers, Trenton Channel Power Station, 501*
— Tubes, Strength at High Temperatures, 702, 723
Superstellar Sextant, Huson, 103
Supervising Electrical Engineers, Association of, Competition for Highfield Shield, 316
Surface-Combustion Gas Burners, Cox's Ignite Combustors, 221*
— Condensers. See *Condensers*
— Grinding Machine. See *Grinding* under *Machine Tools*
— Machined, Irregularities of, 373*
— Temperature Measurements, Thermometer for (Negretti & Zambra), 102*
— Tension, Methods of Measurement, 212
— — of Solders, 212
Surge Tanks, Ferro-Concrete, Lanarkshire Water Power Plants, 768*
Survey, Physical and Chemical, of National Coal Resources, Report on Wigan Seam, Lancashire Coalfield, 414
Surveying, Aerial, Photographic (Review), 141
— — Rio de Janeiro, 486
— Anallatic Tacheometer, Internal-Focussing, 350*
— Base-Line Measurement, Catenary and Mechanical Methods, 559*
— Fardi Range Finder, 580
— Gravity, in Great Britain, 697
— Instrument, the Oldest Theodolite, 643
— Operations, Location of Main Bearings, Sydney Harbour Bridge, 559*
— Tests of Measuring Tapes, United States Bureau of Standards, 623. See *Errata*, 805
— Watts-Szepessy Direct-Reading Tacheometer, 103
Surveyors' Institution, Scholarships, 320; Entrance Examinations, 638
Suspension Bridge. See *Bridge*
Swan, A. D., on Vancouver Harbour Bridge, 151
Swan, Hunter & Wigham Richardson, Ltd., Floating Dock for Singapore, 84*; S.S. "City of Roubaix," 175; M.S. "Zealandic," 525*
Swan, J., on Early American Armed Cruisers, 54; On the Effect of Silicon on Tungsten Magnet Steel, 554*. See 600, 632
Swansea Gas Light Co., Morriston Works, 743
— University College, Engineering Scholarships, 174
Swarf, Cutting Machine for, 284*
Swinden, Dr. T., on Chromium-Steel Rails, 617. See 602, 632
Swiss Railways, Electrification of, Operating Results, 481
Switch, Contact, for Instruments, 101*
— Motor-Starting. See *Motors, Electric*
Switchboards, Power, Standard Specification, 494
Switchgear, Automatic Sub-Stations, Brighton, 649*
— Circuit-Breaker, High-Speed (Siemens-Schuckert Werke), 329*

Switchgear Circuit Breaker, Oil-Immersed, Double-Break Type (British Thomson-Houston Co., Ltd.), 205*
— — Breaker, Oil-Immersed (G. Ellison), 206*
— — Breaker, Oil-Immersed, Push-Button Control (British Thomson-Houston Co., Ltd.), 205*
— — Breakers, 120,000-volt, Trenton Channel Power Station, 793*
— — Breaker, Welded-Steel Case, for Mining Work (G. Ellison), 206*
— Fires, Carbon-Dioxide Extinguishing Installation, Barking Power Station, 441*
— Flame-Proof Draw-Out Type Switch Pillars (A. Reyrolle & Co., Ltd.), 206*
— Klingenberg Power Station, 59
— Lanarkshire Water-Power Stations, 794
— Manufacture, Metropolitan-Vickers Electrical Co., Ltd., 815*
— Metal-Clad, Portobello Power Station, Edinburgh, 815*. See 811
— Oil Switch (Siemens-Schuckert Werke), 329*
— Pressures Produced by Arcing in Closed Vessels, 715
— — Produced by Blowing Fuses, 715
— Progress with, and Power-Station Design, 728, 754
— Trenton Channel Power Station, 796*
— Triple-Pole Switch Plug (Donovan & Co.), 255*
— Truck-Type Cubicle (Metropolitan-Vickers Electrical Co., Ltd.), 221*
— — Type, 11,000-volt (G. Ellison), 206*
Sydney Harbour Bridge, Construction of Approach Spans and Abutment Towers, 467*. See *Erratum*, 540; Location and Erection of Main Bearings, 559*; Tests of Model Members for, 697*
— — Double-Ended Screw Passenger Steamers, 397*, 408
Sykes, C., on Zirconium Alloys, 315
Sylphon Water-Mixing Valve, Automatic Temperature Control, Crosby, 276*
ymons Memorial Lecture, Royal Meteorological Society, 455
Synthetic-Ammonia Industry, German, 536
Syphons, Drainage, Upper Jhelum Canal, 20
— Thermic, Nicholson, Locomotive Boiler, 347*
Systems, Shop. See *Works Management*

T.

TACHEOMETER, Anallatic, Internal-Focussing, 350*
Takoradi Harbour, Gold Coast Colony, 455*
Talbot, B., on Basic Open-Hearth Process, 547
Talybont Water-Supply Scheme, Newport, Mon., 89
Tanganyika, Trade of, Report, 273
Tangential Water Wheels. See *Pelton Wheels*
Tanks, Automatic Water-Level Control for (Siemens-Schuckert Werke), 328
— Expansion, 132,000-volt Oil-Filled Cables, 177*
— Experimental, Froude, Comparisons of Model Propellers in Air and Water, 409; Investigation of Effect of Fins in Propeller Aperture, 438, 461*
— Load, Turbo-Generator Tests, Metropolitan-Vickers Electrical Co., Ltd., 763*
— Locomotives. See *Locomotives*
— Oil, Causes and Prevention of Fires, 296. See 360
— — Protection from Lightning, 360. See 296
— Sewage, Comparisons of Types, 760, 789
— Ships, Motor. See *Motor*
— Shop, Metropolitan-Vickers Electrical Co., Ltd., 280*
— Steamers. See *Steamers*
— Tests, Adjustable-Blade Propellers, 54
Tapes, Measuring, Tests of, United States Bureau of Standards, 623. See *Errata*, 805
Tapsell, H. J., on Fatigue-Resisting Properties of Steel, 557*. See 578
Tar, Coal, the Higher Hydrocarbons (Review), 372
— Low-Temperature, Chemical Investigations, 611
Tariffs, Electric Power, Effect on Consumption, 388
Tata Hydro-Electric Power Co., Bhira Power Station, 747*, 771*, 819*
Tate Gallery, Natural Lighting of, 716*
Taxation, Motor-Car, Statistics, 172
Taylor, C. P., on a Deep-Water Jetty, Bevan's Cement Works, 445
Taylor, H. B., on High-Speed Heavy Oil Engines, 229
Taylor, J. I., on the Vibration of Ships, 199. See LETTER, 227; Statistical Analysis of Voyage Abstracts, 440
Taylor, Prof. G. I., Behaviour of Curved Bodies in Air Stream, 644
Teaching. See *Education*
Technical College and Education. See *Education*
— Institutions, Association of, Annual Meeting, 262
— Papers, Index to, 790
— Societies. See *Institutions* and PARAGRAPH INDEX
Technology, Art and Science in Relation to, 779
Teddington, Chemical Research Laboratory, Investigations of Low-Temperature Tar, 611
Teeth, Gear. See *Gear*
Telegraph Lines, Indo-European System, 209*
Telegraphy, Wireless, Apparatus at Physical and Optical Societies' Exhibition, 68. See 237*
— — Equipment at Croydon Aerodrome, 190*
— — Generators for High-Tension Current Supply, 224*
— — Invention and Development, 755
— — Moullin High-Frequency Ammeter, 655*
— — Sullivan-Griffiths Precision Variable Air Condenser, 237*
— — See also *Valves, Thermionic*
— See also *Electricity* in PARAGRAPH INDEX
Telephone Developments, London Area, 170
— Traffic Problems, Machine for Solving, 655
Telephony, Wireless, Apparatus at Physical and Optical Societies' Exhibition, 68. See 237*
— — Equipment at Croydon Aerodrome, 190*
— — Generators for High-Tension Current Supply, 224*
— — Invention and Development, 755
— — Moullin High-Frequency Ammeter, 655*
— — Sullivan-Griffiths Precision Variable Air Condenser, 237*
— — See also *Valves, Thermionic*
— See also *Electricity* in PARAGRAPH INDEX
Temperature-Control Apparatus, Automatic, Steam and Water, Crosby, 273*
— — Automatic, of Vulcanisers (Drayton Regulator and Instrument Co., Ltd.), 460*
— Deviation Indicator, Cambridge Signal-Lamp Type, 50; Negretti and Zambra's, 221*
— Fluctuations in the Ground, 608
— Indicator, Automatic, for Electrical Machinery (A. Reyrolle & Co., Ltd.), 206*
— Measurement, Treatise on (Review), 472
— — See also *Pyrometry*
— Recorder for Pyrometers (Negretti & Zambra), 221*
— Surface, Thermometer for Measuring (Negretti & Zambra), 102*
Tempering. See *Heat Treatment* under *Metallurgy*
Tensile Tests. See *Tests (Materials)*
Tension, Surface. See *Surface Tension*
Teredo Navalis, Destruction of Marine Structures by, 757*
Terminal, Tidewater, Port of Boston, 97*. See 34*
— Wolfe's Cove, Port of Quebec, 183*
"Tern," Shallow-Draught Gunboat, 333*
Ternary Alloys. See *Alloys* under *Metallurgy*
Testing Apparatus, Silk, British Silk Research Association, 655
— Department, Turbines and Electrical Machinery, Metropolitan-Vickers Electrical Co., Ltd., 659*, 733*; Meters and Instruments, 815*
— Fuel, Sodium-Peroxide Bomb Calorimeter, 623*
— Insulating Materials, Schering Bridge for, Cambridge Direct-Reading Type, 50*
— Machine, 1,250-ton Universal, Tests of Sydney Harbour Bridge Members, 697*
— — See also *Tests (Materials)*
— Materials, American Society for, Papers on Concrete, 121; Proceedings at French Lick Meeting (Review), 530
— Permanent Magnets, Apparatus for, 101
— Plant, Locomotive, Altoona, Experimental Results on Three-Cylinder Compound Engine, 103
— — Locomotive, Value of, 359
— See also *Tests (Materials)*
Tests, Acceptance, International, Steam Turbines, 709
— Aeronautical. See *Aeronautics*
— Cantilever-Beam, Strength of Concrete, 495 See 121
— Corrosion. See *Corrosion*
— Early Dynamos, United States, 484
— Endurance, of Wire Ropes, 516*, 522*
— Experimental Diesel Engines, Admiralty Engineering Laboratory, 407, 425*, 462*
— Fan, Standardised, Report, 357
— Magnetic. See *Magnetic*
— Marine Diesel Engine, M.A.N. Two-Cycle Double-Acting Type, 88

Tests (Materials):

Alternating Stress, Behaviour of, Single Metallic Crystals, 232, 264. See 200
— — the Fatigue of Metals (Review), 370
— — Fatigue Phenomena, 200, 232, 264
— — Tests, Building Materials, 239
— — Tests, Cast Iron, 14, 142
— — Tests, Elastic Hysteresis in, 295
— — Tests, Electrically-Normalised Steel, 684. See 632
— — Tests, Haigh Type, of Lead, 335*. See 297
— — Tests, Mild Steel, Different Temperatures and Stresses, 557*, 578
— — Tests, Steel Spring Plates, 419
— — Tests, Wires, 525
Bending, Repeated, Tests of Wire Ropes, 516*, 522*
Compression Tests, Sydney Harbour Bridge Members, 697*
Concrete, Strength of, Cantilever Beam Test, 495
— Transverse Tests for, 121
Creep of Armco Iron at High Temperatures, 672
— Stress, Limiting, Steel for Boiler and Superheater Construction, 723. See 703, 728
Drop Tests, Chain Links, Effects of Proofing and Annealing on Brittleness, 2*
Elastic Hysteresis, Experiments on, 295
Extensometer, Determination of Young's Modulus for Concrete, 131*
Hardness, Brass, Bronze and Aluminium Bronze, Effect of Heat Treatment, 492*
— Brinell, of Cold-Worked Soft Metals and Eutectics, 313
— Tester, Pendulum, Properties of Cutting Tools, 51
— Tests, Strain-Hardened Armco Iron, Effect of High Temperatures, 672
Hysteresis, Elastic, Experiments on, 295
Impact Tests, Tensile and Notched-Bar, Wrought-Iron Chains, 619*, 654. See 2*, 515, 741
Magnetic Tests. See *Magnetic*
Materials, Strength of, Treatise on (Review), 471
Notched-Bar Impact Tests. See *Impact Tests* (above).
Pendulum Hardness Tester, Properties of Cutting Tools, 51
Stress Determination, Optical. See *Optical* — in Materials and Structures. See *Stress*

Tests (Materials)—*continued.*

Sydney Harbour Bridge, Tests of Model Members, 697*
Tensile Tests, Electrically-Normalised Steel, 683. See 632
— — Eyebars for Carquinez Strait Bridge, California, 5.
— — High-Temperature, Heat-Resisting Steels, 589, 601, 622, 632
— — High-Temperature, Steel for Boiler and Superheater Construction, 723. See 703, 728
— — Lead, Influence of Prolonged Stress, 334
— — Nickel-Chromium Steel, Unusual Fracture, 55*
— — Prolonged High-Temperature, Armco Iron, 672
— — Sydney Harbour Bridge Members, 697*
— — Wire, Combined with Twisting, 525
— — Wire, Effect of Lateral Pressure, 524
— — Wire Rope, Sydney Harbour Bridge Construction, 698*
— — Wrought-Iron Chains, 619*, 654. See 2*, 515, 741
Testing Department, Mechanical, Metropolitan-Vickers Electrical Co., Ltd., 122*
— Machine, 1,250-ton Universal, Tests of Sydney Harbour Bridge Members, 697*
Wearing Tests, Road-Paving Bricks, 96
Wires, Combined Tension and Twisting Tests, 525
— Effect of Lateral Pressure on Tensile Strength, 524
— Fatigue Tests of, 525
— Ropes, Endurance Tests of, 516*, 522*
— — Sydney Harbour Bridge Construction, Tensile Tests, 698*
Tests of Measuring Tapes, United States Bureau of Standards, 623. See *Errata*, 805
— Oxygen-Demand, River Poilution, 544
— of Pit Props, Safety in Mines Research Board, 28
— of Steam Nozzles, Report on, 107, 109*, 116*, 147*, 207*. See LETTER, 174
— Washing, Coal from Wigan Seam, 414
Text Books. See LITERATURE INDEX
Textile Machinery Industry, Position and Prospects, 171
Thames Bridges, London, Report of Royal Commission, 20
— Iron Works, Electrolytic-Iron Plant, 339*
— River, Charing Cross Bridge, Ministry of Transport Proposals, 513, 609. See LETTER, 738
— — Deep-Water Jetty at Northfleet, 445
— — London, Floods from Tidal Wave, 48, 77, 294. See LETTER, 74
Theodolite, the Oldest, by H. Cole, 1574, 643
Therapeutical Uses of Gas Appliances, 770
Thermal Conductivity, Aluminium Alloys and Bronzes, 301*. See 312
— Efficiency Standards, Internal-Combustion Engines, 10
— Insulation, Gas-Retort Settings, 800
— Stresses in Boiler Plates, 777
— Treatment, Metals. See *Heat Treatment* under *Metallurgy*
Thermic Syphons, Nicholson, Locomotive Boiler, 347*
Thermionic Valves. See *Valves; Telegraphy, Wireless; Telephony, Wireless*
Thermocouples, Vacuum, (Elliott Brothers & Co., Ltd.), 101*
— See also *Pyrometer*
Thermodynamics Applied to Engineering (Review), 529
— — Treatise on (Review), 780
— Cycle, Atkinson, Citroën Petrol Engine, Kinematics of, 277*
— — for Locomotives, 103
— and the Development of the Steam Engine, 710, 755
— High-Pressure Steam for Marine Propulsion, 701, 721
— — Pressure Steam, Use on Locomotives, 103
— Properties of Steam, Progress of American Research, 202
— Steam, High-Pressure, Operating Experiences, Lakeside Power Station, 25*, 55*
— — Nozzle Flow, Investigation by Dimensional Theory, 80
— — Nozzles Research, Report on, 107, 109*, 116*, 147*, 207*. See LETTER, 174
— — Turbines, Advantages of High Pressures and Temperatures, 727, 728, 752, 753*
Thermometer, Dial, with Lamp-Signalling Attachment (Negretti & Zambra), 221*
— Maximum and Minimum, Analysis of Observations, 540
— for Surface Temperature Measurements, (Negretti & Zambra), 102*
— See also *Pyrometer*
Thermometry, Temperature Deviation Indicator, Cambridge Signal-Lamp Type, 50
Thermostat, Automatic Temperature Control, Steam and Water, Crosby, 275*
Thermostatic Control, Temperature of Vulcanisers, 460*
Thieme, C. O., on Contamination of Scrap Metal, 696
Thomson, Prof. G. P., Experiments on Wave Mechanics, 506
Thomson, T., on the New Plant of the Appleby Iron Co., Ltd., 551*, 584*. See 578
Thornycroft, J. I., & Co., Ltd., Destroyers for Chilean Navy, 111. See 638
Thorpe, W. H., Historical Exhibit, Institution of Civil Engineers Conversazione, 709
Threads, Screw. See *Screw*
Three-Phase. See *Generator; Motor; Locomotive; Power; Railway*
Throttle Valve. See *Valve*
Thrust Bearing. See *Bearing*
— of Propellers. See *Propellers; Aeronautics*
Thurley Pipe Wrench, 255*
Tidal Wave, River Thames, London Floods from, 48, 77, 294. See LETTER, 74
Tides, Power Production from, French Projects, 200
Tides, Power Production from, Possibilities of, 759, 785
Tidewater Terminal, Port of Boston, 97*. See 34*
Tilting Weirs, Automatic, Lanarkshire Water Power Plants, 767*
Timber Centring, Ferro-Concrete Arch, Royal Tweed Bridge, Berwick, 527*
— Cribs, Foundations of Wharf Walls, Port of Quebec, 184*
— Empire-Grown, Exhibition, Imperial Institute, 166
— Kiln-Seasoning of, Report, 348
— Piling, San Francisco Bay, Destruction by Marine-Boring Organisms, 757*
Time Measurement, Accuracy in, 612
Tin Alloys. See *Alloys* under *Metallurgy*
— and Tinplate Prices. See *Metal-Price Diagrams*
Tingey, R. H., on Car-Float Strength and Deflection, 54
Tinsley, H., & Co., Exhibits at Physical and Optical Societies' Exhibition, 101*
Tizard, H. T., on Organisation of Research, 385
Tolerances in Machine Work. See *Gauges; Gauging*
— Standard, Reamer Diameters, 729
Tomlinson, G. A., on Accuracy of Hob-Cut Gears, 465*, 531*, 598*
Tools, Cutting, Hot-Hardness and Cutting Properties, 51
— — Research Committee, Report on Cutting Temperatures, Discussion, 51
— Machine. See *Machine Tools*
— Pneumatic. See *Machine Tools*
— Room, Metropolitan-Vickers Electrical Co., Ltd., 277*
— Steel. See *Steel*
Toothed Gears. See *Gear; Gearing; Marine Propulsion*
Torchio, P., on 132,000-volt Cables, 177*
Toronto, National Exhibition and Steel and Power Show, British Participation, 482, 612
Torpedo Boats and Destroyers. See *Warships*
Torrent Pressure Filter, Industrial Water Supplies, 223*
Torrey, P. D., on Oil Production by Flooding, 818
Torsion Balance, Eötvös, Use in Geology and Prospecting, 219, 696
Tottenham, Gas-Distributing System, 769
Towers, Abutment, Sydney Harbour Bridge, Design and Construction, 467*
Town Gas. See *Gas*
Townend, C. B., on Power Gas from Sewage Sludge, 162
Townend, W. T., on Economics of Electric Power Production, 742
Track Equipment, Electrification of South African Railways, 652*
— — Post Office Tube Railway, 153*
— Railway, Design and Maintenance, Effect of Electrification, 700, 720. See 814
— — Historical Exhibits, Institution of Civil Engineers' Conversazione, 708
Trackwork, Tramway, Standard Specification, 623
Traction Dynamometer. See *Dynamometer*
— Electric. See *Railways; Tramways*
Tractor, Chain-Track, Weserhütte Cable-Laying Machine, 681*
Trade, Agricultural Machinery, Imports and Exports, 324
— Argentine, Report on, 108
— Australian, Report on, 417
— Belgian, Report on, 610
— British, with Canada, Development of, 230, 482. See 612
— — Causes of Depression, 546
— Canadian Market for British Electrical Fittings, 230
— of Chile, Report on, 548
— Chinese Machinery Imports, 174
— Coal, British Exports, Effect of Strike, 452. See 450
— Disputes. See *Labour*
— East Africa, Report, 273
— Electrical Machinery, Imports and Exports, 61
— Empire, Development of, Importance of Personal Contact, 482. See 612
— Engineering and Allied, Position and Prospects, 21, 61, 91, 139, 171, 248, 294, 324, 357, 388
— — Export, and National Saving, 484
— — Sales Organisation, 778
— Exhibition. See *Exhibition*
— German, Report on, 157
— Indian, Import, Report on, 299
— and Industry, Committee on, Reports, 449, 576
— — United States, Report, 466
— International, Ocean Transport in, 635
— Locomotives, Imports and Exports, 294
— Machine Tools, Imports and Exports, 248
— Machinery Imports and Exports, Statistics, 21, 61, 91, 139, 171, 248, 294, 324, 358
— — Importers' Association, Policy, 779
— Marine Engines, British Exports, 358
— Motor Car Imports and Exports, 91
— — Cycles and Cycles, Imports and Exports, 139
— Northern Africa, Development, and Transport Facilities, 130
— Paraguay, Report on, 804
— Port of Boston, Statistics, 99
— — of Quebec, Statistics, 183
— Soviet Union, with United States, 432
— Standardisation and Simplified Practice in Manufactured Goods, 324
— Statistics, Need for Prompt Publication, 450
— Textile Machinery, Imports and Exports, 171
— Unions. See *Labour*
— Wastes, Gas Works, Disposal of, 769
Traffic Advisory Committee, London and Home Counties, Report, 19
— on Roads, Statistics, 726, 750
Trafford Park Works, Metropolitan-Vickers Electrical Co., Ltd. See *Metropolitan-Vickers*
Train-Control Apparatus, Post Office Tube Railway, 154*

Train Ferry, Motor, "Korsör," Danish State Railways, 41*
— See also *Railway*
Training. See also *Education; Apprenticeship*
Tramway Poles, Tubular, Standard Specification, 228
— Trackwork, Standard Specification, 623
— See also PARAGRAPH INDEX
Transformation of Matter, 315*, 360*, 387*. 422*
Transformers, Condenser-Type Insulating Bushings for, 403*
— Department, Metropolitan-Vickers Electrical Co., Ltd., 765*
— Development of, and Power Station Design, 729, 754
— Instrument, Treatment of Coils, Metropolitan-Vickers Electrical Co., Ltd., 407*
— Principles of Design (Review), 141
— Tanks, Manufacture, Metropolitan-Vickers Electrical Co., Ltd., 280*
— Trenton Channel Power Station, 797*
Translucent Glassware, Illumination Fittings, Standard Specification, 400
Transmission Dynamometer. See *Dynamometer*
— Gear. See *Gear; Gearing; Marine Propulsion; Motor-Car Details*
— Lines, Overhead. See *Overhead*
— of Power. See *Marine Propulsion; Power Transmission*
Transit Sheds, Ferro-Concrete, Avonmouth Docks, 569*. See 591*
Transport, Aerial. See *Aeronautics*
— Goods by Passenger Train, Payment of Charges, 645
— — by Rail, Legal Position, 503
— Institute of, Use and Maintenance of Pneumatic Tyres as Applied to Commercial Vehicles, by L. G. W. Shire, 18. See LETTER, 351; Annual Dinner, 352; Presidential Address on Swiss Railway Electrification, by R. T. Smith, 481; Southern Railway Electrification, by E. C. Cox, 481; Congress at Liverpool: Mersey Dock Estate, by L. A. P. Warner, 634; Liverpool's Road-Traffic Requirements, by J. A. Brodie, 635; Ocean Transport in International Trade, by Sir N. Hill, 635; Industrial Co-Operation as an Economic Factor, by Sir J. C. Stamp, 636
— Ministry of, Control of Condensing Water Supplies, 170; Statistics of Motor-Car Taxation, 172; Royal Tweed Bridge, Berwick, 527*, 615*; Proposed Road Bridge at Charing Cross, 513, 609. See LETTER, 738
— Motor. See *Road; Motor*
— Ocean, in International Trade, 635
— Railway, Suggested State Aid for Rates Reduction, 776
— — See also *Railway*
— Road. See *Road; Motor*
Transverse Tests. See *Tests (Materials)*
Tranter, W. J., Ltd., Sediment Blowing-Off Device for Boilers, 256*
Trash Screens, Electrically-Heated, Shawinigan Falls Power Plant, 514
Travelling Crane. See *Crane*
— Expenses, Government Appointments, Allowance for, 615
— Pneumatic Elevator for Grain, Avonmouth Docks, 591*
Trench, E. F. C., on the History of the Institution of Civil Engineers, 707. See 699
Trenching Machine for Cable Laying, the Weserhütte, 631*
Trenton Channel Power Station, Detroit Edison Co., 341*, 369*, 433*, 499*, 532*, 603*, 629*, 660*, 690*, 782*, 795*
Trials, Diesel-Engine Locomotives, Russian Railways, 504
— Marine Diesel Engine, M.A.N. Two-Cycle Double-Acting Type, 88
— See also *Tests*
Trieber, O. D., on Diesel-Engine Design, 89
Triple-Expansion Engines. See *Engines, Steam*
Tripolitania, Economic and Commercial Conditions, Report, 130
Trucks, Electric-Battery, Southampton Docks, 802. See 809
— Four-Wheel, Locomotive for Canadian National Railways, 473*. See 347*
— London Underground Railways, Repairs at Acton Works, 646*
— Motor, with Hydraulic Lifting Gear, the Gerlinger, 13*
— Railway. See *Wagons*
— Steel (Metallisation, Ltd.), 256
— See also *Bogie*
Tubes, Boiler and Superheater, Strength at High Temperatures, 702, 723
— Failures, High-Pressure Boilers, Lakeside Power Station, Milwaukee, 25*, 55*; S.S. "King George V," 352
— Iron, Electrolytic Manufacture, 339*
— Plates, Condenser, Drilling Machine, Metropolitan-Vickers Electrical Co., Ltd., 657*
— Railways. See *Underground Railways*
— Steel, Manufacture by Mannesmann Process, Investigations, 269*
— Wells. See *Wells*
— See also *Pipes*
Tungsten Magnet Steel, Influence of Silicon, 554*, 600, 632
Tunisia, Economic and Commercial Conditions, Report, 130
Tunnel Construction, Lanarkshire Water Power Plants, 768*
— Water-Power Plants, Progress in Design, 786. See 759
Tunnelling Operations, Post Office Tube Railway, 92*
Turbine, Exhaust-Steam, Bauer-Wach System, S.S. "Britannia," 206
— Hydraulic, Automatic Control Gear, 793*
— — Bonnington and Stonebyres Power Stations, Lanarkshire, 791*. See 767*
— — 30,000-h.p., Pelton-Wheel Type, Bhira Power Station, 747*, 771*; Exciter Sets, 821*
— — Power Production from Tides, 759, 785
— — See also *Power Plant; Pelton Wheels*
— Pumps. See *Pumps, Centrifugal*
Turbine, Steam, Advantages of High Pressures and Temperatures, 727, 728, 752, 753*
— — Balancing Machine for Rotors, Metropolitan-Vickers Electrical Co., Ltd., 657*
— — Blade Manufacture, Machining Operations, Metropolitan-Vickers Electrical Co., Ltd., 188*
— — Deposits on Blading from Boiler Compounds, 56*
— — Dimensional Theory of Nozzle Flow, 80
— — High-Pressure, Lakeside Power Station, Operating Experiences, 25*, 56*
— — Impulse-Type, Formula for Wheel Friction, 296
— — Impulse-Type, Geared, and 300-kw. Direct-Current Generator, H.M.S. "Rodney" (W. H. Allen, Sons & Co., Ltd.), 375*
— — International Acceptance Tests, 709
— — for Locomotives, Recent Practice, 751. See 726
— — Marine, Comparisons with Reciprocating Engines and Oil Engines, 378*, 389, 430*
— — Marine, under Construction, Lloyd's Statistics, 484
— — Marine, Geared, S.S. "Duchess of Bedford," 675*
— — Marine, High-Pressure, S.S. "King George V," Results, 379. See 390
— — Materials and Design (Review), 33
— — Report on Nozzles Research, 107, 109*, 116*, 147*, 207* See LETTER, 174
— — Trend of Development, 727, 752. See 728, 753*
— — See also *Turbo-Generators*
— Steamers. See *Steamers; Warships*
Turbo-Generators, Advantages of High Pressures and Temperatures, 727, 728, 752, 753*
— — Development of, and Power-Station Design, 728, 754*
— — 300-kw. Direct-Current Geared, for H.M.S. "Rodney," (W. H. Allen, Sons & Co., Ltd.), 375*
— — 2,000-kw. Alternating Current, for Auxiliary Services, Trenton Channel Power Station, 629*
— — 4,000-kw. Geared Direct-Current, Auxiliary Services, Trenton Channel Power Station, 629*
— — 1,500-kw., Guildford Power Station, Governing and Valve Gear (C. A. Parsons & Co., Ltd.), 713*. See 709
— — 80,000-kw., Klingenberg Power Station, 59
— — Manufacture and Testing. See *Metropolitan-Vickers Electrical Co., Ltd.*
— — 20,000-kw., Shanghai Power Station, 685. See 805
— — 50,000-kw., Trenton Channel Power Station, 604*
— — Plant, Materials and Design in (Review), 33
Turbulence in Marine Oil Engines, Effects, 40
Turner, Engr.-Capt. A., on Experimental Diesel Engines, 425*, 462*. See 407
Turner, Prof. W. E. S., on Ultra-Violet Ray Transmission through Glass, 487
Turning and Boring Mills. See *Machine Tools*
Turnings, Machine Tool, Cutting Machine for, 284*
Turret Lathes. See *Lathes* under *Machine Tools*
Tutin, J., on Cavitation, 439
Tuyeres, Auxiliary, for Cupolas, Poumay System, 744*
Tweed, River, Ferro-Concrete Road Bridge, 527*, 615*
Tyndall, Prof. A. M., on Carriers of Electricity in the Atmosphere, 546
Tyne, River, Steel-Arch Bridge, Newcastle, Erection of, 266*
Typesetting, Effect of Lighting on Output and Accuracy, 504
Tyres, Pneumatic, for Motor Omnibuses, 18. See LETTER, 351

U.

UGANDA, Trade of, Report, 273
Ultra-Violet Light, Fading of Peacock Feathers in, 655. See 779
— — Light, Fluorescence of Minerals in, 655
— — Light, Transmission through Bottle Glass, 487
— — Refractometer, Hilger's, 49
Underground Railways, London, Acton Overhaul Works, 645*
— — Automatic, for Mails, London, 92*, 153*, 214*, 250*, 309*. See LETTER, 299
Unemployment. See *Labour*
Uniflow-Type Heat-Extraction Steam Engine (Galloways, Ltd.), 318*
Unions, Trade. See *Labour*
United States Bureau of Mines, Oils from Coal and Oil Shale, Comparisons, 9; Investigations of Ore Extraction by Ferric Sulphate-Sulphuric Acid Process, 30; Sampling Atmospheric Dust in Mines, Impinger-Plate Method, 290; Hydrogen Sulphide Poisoning by Petroleum Vapours, 349; Report on Production of Sponge Iron, 361; Acid Processes for Extraction of Alumina, 375; Notes on Estimation of Carbon Monoxide in Mines, 507; Observations of Temperature Fluctuations in the Ground, 608
— — Bureau of Public Roads, Tests of Brick-Paved Roads, 96
— — Bureau of Standards, Methods of Measuring Surface Tensions, 212; Transmission of Sound Through Building Materials, 368; Investigations on Chromium Plating, 550; Tests of Measuring Tapes, 623. See *Errata*, 805
— — Early Dynamo Tests, 484
— — Early Steamboats on Lake Champlain, 549
— — Electricity-Supply Statistics, 202
— — Improvement of Great Lakes and River St. Lawrence, 62*, 114*, 125*, 137
— — Iron and Steel Industry, Economic and Social Development, 467
United States, Life of Steel Buildings, 433
— — Niagara Falls, Preservation Proposals, 418*
— — Navy. See *United States* under *Warships*
— — Port of Boston, 34*, 97*
— — Railways. See *Railways; Railroads*
— — Report on Economic Conditions, 466
— — Researches on Properties of Steam, Progress, 202
— — Shipping Board Conversion Programme, Diesel Engines for, 88
— — Trade with Soviet Union, 432
— — Water Power, Public and Private Ownership, Comparisons, 642
— — See also *America*
United Water Softeners, Ltd., Exhibit at Ideal Home Exhibition, 483
Universal Grinding Machine. See *Grinding Machine* under *Machine Tools*
University College, Swansea, Engineering Scholarships, 174
— See also *Education*
Unloading Machine, Coal, Trenton Channel Power Station, 369*

V.

VACUUM Brake. See *Brake*
— Pump. See *Pump*
— Thermocouples (Elliott Brothers & Co., Ltd.), 101*
Valuation, Depreciation, and the Rate Base (Review), 693
— of Industrial Premises and Plant for Rating, 258, 775
Valves, Automatic-Temperature Control, Steam and Water, Crosby, 275*
— Drop, Hydraulically-Operated, Galloway Heat-Extraction Engine, 318*
— Exhaust, Oil Engine, Paxman-Lentz Quick-Acting Gear, 226*
— Gear, Locomotive, Baker Type, 347*
— — Locomotive, Grinding Machine for Expansion Links, 521*
— Gate, Rotary, Circulating-Water System, Trenton Channel Power Station, 691*
— Stop, Explosion on S.S. "Bellview," 518
— — Explosion on S.S. "Empirestar," 518
— — Explosion in Textile Mill, 518
— — Hydraulic Turbines, Lanarkshire Power Stations, 793*
— — Non-Jamming Full-Way (J. Blakeborough & Sons, Ltd.), 41*
— — for Superheated Steam, Koswa, 327*
— Thermionic, Invention and Development, 755
— — at Physical and Optical Societies' Exhibition, 68, 69
— — and Rectifiers, Treatise on (Review), 472
— — Use with High-Frequency Induction Furnaces, 572
— — See also *Telegraphy, Wireless; Telephony, Wireless*
— Water-Mixing, Sylphon, Automatic Temperature Control, Crosby, 276*
— and Valve Gear. See also *Engines*
Van der Giessen's Werktuigenfabriek, Listproof Davits, 505*. See 541
Vancouver Harbour Bridge, 151
— Pier at, Piling Operations, 202
Variable-Speed Gear, Ltd., Williams-Janney Variable-Delivery Pump, 288*
— — Gear. See *Gear; Motor-Car Details*
Varnish-Impregnation Plant, Metropolitan-Vickers Electrical Co., Ltd., 407*
— and Paint, Standard Specifications, 756, 803
Varnished Cloth, Electrical Insulation, Microscopic Examination, 621*
Vauxhall, Early Engineering Works and Gun Factory, 709
Veedol, Viscosity at High Pressures, 281
Vegetable Wastes, Production of Alcohol from, 78
Venner Motor for Clock Winding, 102
Ventilating and Heating Engineers, Institution of. See *Heating and Ventilating Engineers*
— System, Trenton Channel Power Station, 795*
Ventilation of Deep Mines, 759, 787
— Timber Seasoning Kilns, 348
Verein Deutscher Eisengiessereien, Conference, 811
— — Ingenieure, Annual Conference, Essen, 735, 777
"Vermont," Early American Steamboat, 549
Vernier, C., the Late, 134
Vertical-Shaft Sinking, Treatise on (Review), 528
Vibration Galvanometer, Schering, 101*
— Mechanical, Treatise on (Review), 34
— of Ships, Causes, 199. See LETTER, 227
Vibrograph, Cambridge Low-Periodicity, 50
Victaulic Pipe Joints, Use for Marine Purposes, 772
Vignoles, Lieut.-Col. W. A., on Electricity for Domestic Purposes, 738
Viscosity, Lubricating Oils, at High Pressures, 281; at High Temperatures, 628
Viscous Liquids, Flow through Pipes, Alignment Charts, 498*
Vokes, F. C., on Power Gas from Sewage Sludge, 162
Volga, River, Linking up with River Don, 715
Volumetric Efficiency, Marine Oil Engines, 40
Vortex Theory, Screw Propellers, and Application, 439
Vreugdenhil Listproof Davits, 505*. See 541
Vulcanised Fibre, Microscopic Examination 621*
Vulcanisers, Automatic Regulator for, 460*

W.

WADDELL, Dr. J. A. L., on Mathematics and Engineering, 807
Wade Dr. A., on Oil Wells at Hardstoft, 451
Wadkin & Co., Cross-Cut Saw and Circular-Saw Bench, 203*
Wadlow, Dr. E. C., on An Unusual Tensile Fracture, 55*
Wages. See *Labour*
Wagons, Mail-Carrying, Post Office Tube Railway, 216*, 250*
— Motor. See *Motor Wagons; Tractors*
— Railway, Floats for, Strength and Deflection of Hulls, 54
— — Unloading Coal from, Trenton Channel Power Station, 369*
Wales, North, Electricity Scheme, 811*
Wall, Dr. T. F., Determination of Moments of Inertia of Rotors, 213*. See LETTER, 614
— Dock, Ferro-Concrete, Sectional Construction, Royal Edward Dock Extension, Avonmouth, 568*
— Retaining, Concrete, Expansion Joint, 468*
— — Sheet Piling, Earth Pressure on, 303
— — Sydney Harbour Bridge Approaches, 468*
— — Theories of Earth Pressure on, 674
— Sea, San Francisco Bay, Protection against Marine-Boring Organisms, 757*
Wallsend Slipway and Engineering Co., Ltd., Diesel Engines, M.S. "Zealandic," 525*, 7
Walsh, Dr. J. W. T., on Artificial Daylight, 142
Walton, F., the Late, 714
— Slow-Sand Filters, Metropolitan Water Board, 788*. See 760
"Wampanoag," Early American Cruiser, 54
War Office, Appointment of Mechanical Warfare Board, 357
— European. See *European War*
Ward, H. T. S., the Late, 446
Warfare, Mechanical, Appointment of Board by War Office, 357
— Naval. See *Warships*
— Use of Aircraft in. See *Aeronautics*
Warner, L. A. P., on the Mersey Docks, 634
Warren Frequency Meter for Power Stations, 69*

Warships:

Chilean Navy, Torpedo-Boat Destroyers for, 111. See 638
Cruisers, Early American, with Geared Reciprocating Engines, 54
German Battle Cruiser "Moltke," Salvage Operations, 737*
Italian Navy in World War (Review), 83
Japanese Navy, Stream Line Filter for Oily-Bilge Water, 150*
H.M. Aircraft Carrier "Courageous," 257*
— Battleship "Rodney," Turbo-Generators for, 375*
— Destroyer "Wolf," Effective Moment of Inertia, 410
— Naval Base, Singapore, Floating Dock for, 84*
— — Dockyards, Administration of, 249
— — Navy, Diesel-Engine Investigations, Admiralty Engineering Laboratory, 407, 425*, 462*
— — Estimated Expenditure, 1928-29, 325
— — Promotion of Engine-Room Artificers, 674
— — Research and Experimental Work, Pre-War and Present Cost, 687
— — Shallow-Draught Gunboats for the Yangtse-Kiang, 333*
Naval Vessels, Diesel Engines for, 89
— Warfare, Aircraft in (Review), 692. See LETTER, 771
Submarines, Characteristics and Uses, 54
— Diesel-Engines for, 89
Torpedo-Boat Destroyers for Chilean Navy, 111. See 638
United States Navy, Aviation in, 88
— — Navy, Early Cruisers with Geared Reciprocating Engines, 54
— — Navy, Tests of Chain Links, 2*
See also *Naval* in PARAGRAPH INDEX
Washers and Nuts, Standard Specification, 308
Washing, Coal, Classification by Hindered Settling, 818
— — Standardisation of Tests, 818
— — from Wigan Seam, Tests, 414
— Machine, Cask (Mather & Platt, Ltd.), 195*
— — Railway Rolling-Stock Parts, Acton Works, 647
Waste Gases from Boilers, Feed-Water Heating by (Review), 472
— Heat, Steam Generation by, Steel Works, Gas Works, and Marine Oil Engines, 233, 241*, 264, 272
— — Use for Electric Power Production, 742
— — Utilisation in Cement Manufacture, 497, 562
— Weirs, Reservoirs, Capacities of, 788. See 760
Water, Automatic Temperature-Control Apparatus, Crosby, 275*
— Condensing, Legal Position Regarding Supplies, 170
— Conduits, Concrete, Chemical Action of Water, on 111. See *Erratum*, 202
— Cooling, Internal-Combustion Engines, Automatic Temperature Control, Crosby, 276*
— Filters. See *Filters*
— Filtration and Treatment for Domestic Purposes, 760, 787*
— Flow in Channels, New Theory of Silt and Scour, 307*
— — in Corrugated Pipes, 110*
— Gas. See *Gas*
— Heaters. See *Feed-Water Heaters*
— Level Control, Automatic, for Tanks, (Siemens-Schuckert Werke), 328
— Mixing Valve, Sylphon, Automatic Temperature Control, Crosby, 276*
— Pipes, Ferro-Concrete, Billé Rubber Joint for, 803*
— Potable, Microscopy of (Review), 780
— Power. See *Power, Water*; see also *Hydraulic; Pelton Wheel; Power Plant; Turbine, Hydraulic*
— Pressure, Upward, Foundations in Pervious Soils, 514
— Purification, Use of Chlorine, 760, 787

Water Purifiers, Ltd., Domestic Water Softeners, 483
— Resistances, Load Tests of Turbo-Generators, Metropolitan-Vickers Electrical Co., Ltd., 763*
— Sluice System, Ash Handling, Trenton Channel Power Station, 502*
— Softening Plants, Domestic, Ideal Home Exhibition, 483
— Supply, Flood Discharge from Catchment Areas, 760, 788*
— — Historical Exhibits, Institution of Civil Engineers Conversazione, 708
— — Industrial, Torrent Pressure Filter, 223*
— — London, Purification System, 611, 787*. See 760
— — London, Slow-Sand Filters at Walton, 788. See 760
— — Los Angeles, Failure of St. Francis Dam, 419*, 452*, 547, 580, 644
— — Newport, Mon., 89
— — and River Pollution, Research, 218
— — See also *Irrigation*
— Tanks. See *Tanks*
— Tube Boiler. See *Boiler*
— Turbines. See *Turbines, Hydraulic; Pelton Wheels; Power Plants*
— Works. See *Water Supply* and PARAGRAPH INDEX
Waterhouse, H., on the Cracking of Lead Cable Sheathing, 299*, 334. See 297
Waterless Gasholders, Advantages of, 702, 722
Waterways, Silting and Scouring in, New Theory, 307*
— See also *Rivers; Canals; Navigation, Inland.*
Watt, James, and the Steam Engine. (Review), 82
Wattmeters. See *Electric*
Watts, E. R., & Son, Ltd., Direct-Reading Tachometer, 103
Watts, Sir Philip, Presentation of Bust of, to Institution of Naval Architects, 408
Wave Mechanics, Prof. G. P. Thomson's Experiments, 506
Wearing Tests, Road-Paving Bricks, 96
Weather. See *Meteorology*
Weathering of Building Materials, 239
Weighing Crane Loads, 100-ton Spring Balance for, 256*
— Machines, Grain, Avonmouth Docks, 596*, 597*
Weight-Carrying by Women, Report on, 185
Weir, Lord, on High-Pressure Steam for Marine Propulsion, 721. See 701
Weirs, Tilting, Automatic, Lanarkshire Water Power Plants, 767*
— Waste, for Reservoirs, Capacities of, 788. See 760
Welded Joints, Wrought-Iron Chains and Cables, Investigations of Failures, 618*, 652*. See 2*, 516, 741
Welds, Investigation by Röntgen Rays, 777
Welding and Acetylene Association, British. See *Acetylene*
Arc, Equipment, Metropolitan-Vickers Electrical Co., Ltd., 280*
— — Motor-Generator Set for (Metropolitan-Vickers Electrical Co., Ltd.), 224*
— — Physical Properties of Arc, 777
— Autogenous, of Stainless Steel, 478
Welding, Machine, Automatic Electric (Siemens-Schuckert Werke), 328*
— Oxy-Acetylene, Flame Temperature, 777
— — Acetylene, German Investigations, 777
— — Acetylene, Use of Liquid Oxygen for, French Railway Workshops, 691*
Welfare Work. See *Labour*
Welin-Maclachlan Davits, S.S. "Duchess of Bedford," 675*
Wells, Oil, at Hardstoft, Derbyshire, 451
— — Increasing Yield by Compressed Air, 818
Wemyss, Lord, on Shipbuilding Industry, 389
Wentworth-Shields, F. E., on Cement and Concrete for Engineering Structures, 719. See 699; on the Port of Southampton, 800*. See 809
Werkspoor Diesel Engine, M.S. "Greystoke Castle," 380*
Weserhütte Cable-Laying Machine, 681*
West, F., on Firing Refractory Materials with Oil, 336*
West Drayton, Admiralty Engineering Laboratory, Investigations on Diesel Engines, 407, 425*, 462*
Western Ports of North Atlantic, Boston, 34*, 97*; Quebec, 183*
Westinghouse Brake & Saxby Signal Co., Ltd., Prestall Wrought-Steel Vacuum-Brake Cylinder, 144; Vacuum Brake for Motor Vehicles 667*
Westinghouse Electric and Manufacturing Co, Auxiliary Turbo-Generators, Trenton-Channel Power Station, 629*
Wetton, C. E., the Late, 478
Wharf Cranes. See *Cranes*
— Ferro-Concrete, Sectional Construction, Royal Edward Dock Extension, Avonmouth, 568*
— Walls, Timber-Crib Foundations, Port of Quebec, 184*
Wheatstone Bridge. See *Electric*
Wheel Barrow with Creeper Track, 224*
— — Transport of Bricks, Fatigue Investigations, 817
— Chain, P.I.V. Variable-Speed Gear, Milling Operations, 256*
— Grinding. See *Grinding* under *Machine Tools*
— Impulse-Turbine, Blade and Disc Friction, Formula for, 296
— Lathe, Semi-Automatic (W. Hegenscheidt), 283*
Whitaker, A., on Recording and Reproducing Sound, 400*
Whitaker, Prof. E. T., on the Quantum and Relativity Theories of Light, 372
White Metal. See *Alloys* under *Metallurgy*
Whitehouse, J., on Mining at Great Depths, 787. See 759
Whitworth Scholarship Awards, 24; Regulations, 804
Wigan Seam, Lancashire Coalfield, Report on, 414
Willcox, W. H., & Co., Ltd., Penberthy Sump Drainer, 509*
Williams, H. G., on the Effect of National Saving on Engineering Exports, 484
Williams-Janney Variable-Delivery Pump for Hydraulic Accumulator, 288*
Williamson, J., on the Jetty and Pump House Works at Barking Power Station, 319
Willox, W., the Late, 453
Wilson and Gore's Experiments, Stresses in Masonry Dams, 709
Wind of Small Gustiness, 540
— Stresses in Steel-Framed Buildings, 625*
Winding Engines, Electrical, Design, Construction and Operation (Review), 694
Winget (1924), Ltd., Concrete Mixers, 475*
Wire, Combined Tension and Twisting Tests, 525
— Drawing, Compound Diamond Dies for, 102
— Effect of Lateral Pressure on Tensile Strength, 524
— Fatigue Tests of, 525
— Forming Machine (C. Semper), 282*
— Ropes, Endurance Tests of, 516*, 522*
— — Federation of Manufacturers, 645
— — Research, Institution of Mechanical Engineers, 515*, 522*. See 543
— — Research, Safety in Mines Research Board, Report, 28, 543. See LETTER, 645
— — Sydney Harbour Bridge Construction, Tensile Tests, 698*
Wireless Telegraphy. See *Telegraphy*
— Telephony. See *Telephony*
Wöhler's Tests. See *Alternating Stress* under *Tests (Materials)*
"Wolf," H.M. Destroyer, Effective Moment of Inertia, 410
Wolf, Netter & Jakoby Werke, Schiege Concrete Mixer, 285*
Wolfe's Cove Terminal, Port of Quebec, 183*
Wood Coal Dryers, Pulverised-Fuel Plant, Trenton Channel Power Station, 435*
— Kiln-Seasoning of, Report, 348
— Pulp for Insulating Papers, Microscopic Examination, 620*
Woods, H. F. G., on Distribution of Electricity in Rural Areas, 737
Woodward, W. E., on the Rapid Normalising of Over-Strained Steel, 682*. See 632
Woodworking Machinery. See *Machine Tools*
Wool, Belt Conveyors for, Southampton Docks, 802
Woolwich Research Department, Uses of X-Rays, 175; Exhibits at Royal Society Conversazione, 655
Women, Weight-Carrying by, Report on, 185
Works:
Acton Overhaul Works, London Underground Railways, 645*
Appleby Iron Co., Ltd., Iron and Steel Plant, 551*, 584*. See 578
Crewe Locomotive Works, Reorganisation, 358, 362*. See 355. See *Errata*, 414
Electrical Engineering Works, Metropolitan-Vickers Electrical Co., Ltd., See *Metropolitan-Vickers*
— — Works, Bruce Peebles & Co., 811
Gas Works, Colombo, 771
— — Disposal of Liquid Effluents, 769
— — Morriston, Swansea Gas Light Co., 743
— — Steam Generation by Waste Heat, 242*, 272. See 233, 265
Locomotive Repair Shops, Transverse or Longitudinal Arrangement, 355. See 358, 362*
Manufacturing Works, Assessment for Rating, 258
— — Proposed Rates Reductions, 775
Steel Works, Steam Generation by Waste Heat, 241*, 272. See 233, 264
Works Management, Administrative Organisation, Metropolitan-Vickers Electrical Co., Ltd., 816
— — Foundry Cost Keeping, Metropolitan Vickers Electrical Co., Ltd., 123
— — Operating Problems, Coal and Mining Industries, 778
Workshops and Factories, and the Landlord and Tenant Act, 451
— Training. See *Apprenticeship. Education*
— See also *Works; Machine Tools*
Worthington Pump and Machinery Corporation, Condensing Plant, Trenton Channel Power Station, 660*, 690*
Wotan-Werke, Grinding Machine, 326
Wreck Raising. See *Salvage*
— See *Accidents*
Wrench, Pipe, Thurley, 255*
Wrought Iron. See *Iron*
Wuttig, G., Nut-Making Machine, 282*
Wynne-Edwards, R. M., on Ferro-Concrete Piles in Gravel Fill at Vancouver, 202

X.

X-RAYS. See *Röntgen Rays*
Xylonite Models, Stress Determination. See *Optical*

Y.

YANCEY, H. F., on Classification of Coal by Hindered Settling, Washing, 818
Yangtse-Kiang, Shallow-Draught Gunboats for, 333*
Yarrow & Co., Ltd., Shallow-Draught Gunboats for the Yangtse-Kiang, 333*
Yarrow, H. E., on High-Pressure Steam for Marine Propulsion, 721. See 701
— High-Pressure Boilers, S.S. "Duchess of Bedford," 675* See 711
— — Pressure Boilers, S.S. "King George V," Explosion, 352
Year Books. See LITERATURE INDEX
Young's Modulus. See *Elastic Modulus*

Z.

ZANZIBAR, Trade of, Report, 273
"Zealandic," M.S. Machinery of, 525*
Zeiss, C., Optical Dividing Head for Machine Tools, 326
Zeppelin Airships. See *Airships* under *Aeronautics*
Ziegler, N. A., Study of Gases in Metals, 696
Zinc Alloys. See *Alloys* under *Metallurgy*
— Copper-Lead Ores, Metallurgy of, 759, 787
— Prices. See *Metal-Price Diagrams*
Zirconium Alloys, Properties of, 315
Zwicky, Ltd., Pumps for Oil and Petrol, 37*; Filter Nozzle for Petrol Pumps, 212*

ONE-PAGE AND TWO-PAGE PLATES.

PLATE

I. Coal-Handling Plant, Stourport Generating Station: General View; Views of Coal Conveyor Entering Boiler-House, and of Conveyor and Stacker on Storage Ground (Mitchell Conveyor and Transporter Co., Ltd.) (facing page 12)

II. Coal-Handling Plant, Stourport Generating Station: Elevation, Cross Section and Details of Belt Conveyors (Mitchell Conveyor and Transporter Co., Ltd.) (between pages 12 and 13)

III. Coal-Handling Plant, Stourport Generating Station: Views of Quayside Cranes in Canal Basin; of Reclaiming Crane for Storage Ground; of Transit Bunker and Electric Locomotives; and of Coal Conveyors Discharging into Boiler-House Bunkers (Mitchell Conveyor and Transporter Co., Ltd.) (facing page 13)

IV. Danish Motor Train-Ferry "Korsör": Views of Promenade Deck; of Main Deck showing Car Tracks; of Boat Deck, Looking Forward; and of Automatic Gangway (Elsinore Shipbuilding and Engineering Co.) (facing page 42)

V. Danish Motor Train Ferry "Korsör": Elevation; Deck Plans; and Bow and Stern Views (Elsinore Shipbuilding and Engineering Co.) (between pages 42 and 43)

VI. Danish Motor Train Ferry "Korsör": Views of Combined Windlass and Warping Winch; of Steering Gear; and of Main Engines on Test Bed (facing page 43)

VII. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Machine Shop, and of Iron Foundry (between pages 64 and 65)

VIII. Post Office Tube Railway, London: Views of King Edward Building Station; of Tunnels at Mount Pleasant; of Station Junction at Western District Post Office; and of Western District Post Office Station (facing page 92)

IX. Post Office Tube Railway, London: Plans and Sections of Tunnel (between pages 92 and 93)

X. Post Office Tube Railway, London: Views of Tunnel under King Edward Building; of Step Plate Tunnels at Paddington; of Running and Siding Tunnels at King Edward Building; and of 25-ft. Station Tunnel at King Edward Building (facing page 93)

XI. Planing and Moulding Machine, Six-Roller, High-Speed, for Hardwoods: Elevation and Plan; Views of Machine showing Feed Gear-Box and Top and Bottom Profiling Cutter Blocks at the Feeding-Out End (T. Robinson & Son, Ltd.) (between pages 130 and 131)

XII. Post Office Tube Railway, London: Views of Double Track in Tunnel; of E. H.T. Switchgear in Western Parcels Office Sub-Station; of Control Board at Western Parcels Office Station; and of Relay and Contactor Racks (facing page 154)

XIII. Post Office Tube Railway, London: Diagrams of Electrical Connections (between pages 154 and 155)

XIV. Post Office Tube Railway, London: Views of Switch Cabin, Mount Pleasant; and of Cross-Over from Through Line to Platform Berth; Details of Electrically-Operated Contactor for Track Supply (facing page 155)

XV. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Punching Shops; and of Machine for Continuous Punching of Segmental Laminations (facing page 188)

XVI. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Blading Department and of Machining Operations on Straddle Blades (between pages 188 and 189)

XVII. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Completely-Bladed Turbine Rotors; of Method of Attaching Straddle Blades; and of Typical Turbine Diaphragm with Cast-In Blades between pages 188 and 189)

PLATE

XVIII. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views in Main Stores and of One of the Departmental Stores (facing page 189)

XIX. British Industries Fair, Birmingham: Views of Automatic Motor-Driven Cross-Cut Saw; and of 36-in. Roller-Feed Saw Bench (Wadkin & Co.) (facing page 204)

XX. British Industries Fair, Birmingham: Views of Crossley-Premier 150-b.h.p. Heavy-Oil Engine (Crossley Bros., Ltd.); of 8-kw. Direct-Coupled Generator Set (Petters, Ltd.); and of 60-b.h.p. Heavy-Oil Engine (Marshall, Sons & Co., Ltd.) (between pages 204 and 205)

XXI. British Industries Fair, Birmingham: View and Sections of High-Torque Squirrel-Cage Motor; of Contactor-Type Star-Delta Starter; and of All-Electric Traction Control Equipment (General Electric Co., Ltd.); Views of Contacts of Oil-Immersed Circuit Breaker (British Thomson-Houston Co., Ltd.); View of Welded-Steel Case Circuit Breaker for Mining Work (G. Ellison) (between pages 204 and 205)

XXII. British Industries Fair, Birmingham: View of 11,000-volt Oil Circuit Breaker and Section of 11,000-volt Truck-Type Switchgear (G. Ellison); Views of Flame-Proof Draw-Out Type Switch Pillars and of Automatic Temperature Indicator (A. Reyrolle & Co., Ltd.) (facing page 205)

XXIII. British Industries Fair, Birmingham: View and Section of Crankless Gas Engine (National Gas Engine Co., Ltd.); Views of Electrical Temperature Recorder and of Dial Thermometer (Negretti & Zambra) (facing page 220)

XXIV. British Industries Fair, Birmingham: Views of Truck-Type Switchgear Cubicle (Metropolitan-Vickers Electrical Co., Ltd.); of Fuel Economiser (E. Green & Son, Ltd.); and of Annealing Furnace (Metropolitan Fuel Co., Ltd.) (facing page 221)

XXV. British Industries Fair, Birmingham: Sections and View of Rotary Air Compressor, and View of Hand-Operated Air Compressor (Reavell & Co., Ltd.); Elevation and Views of Dust Collector (Davidson & Co., Ltd.) (facing page 222)

XXVI. British Industries Fair, Birmingham: Views of Dust Collector (Davidson & Co., Ltd.); of Steam and Belt-Driven Ammonia Compressors and of Torrent Filter (Pulsometer Engineering Co., Ltd.); Sections of Rotary Pump (Hollings & Guest, Ltd.); and View of Creeper-Track Barrow (J. Allen & Sons (Oxford), Ltd.) (facing page 223)

XXVII. British Industries Fair, Birmingham: Sections and View of Alternating-Current Motor; and View of Arc-Welding Set (Metropolitan-Vickers Electrical Co., Ltd.); Sections and View of Magneto-Electric Generator (M. L. Magneto Syndicate, Ltd.) (facing page 224)

XXVIII. British Industries Fair, Birmingham: Vertical Cold-Starting Heavy-Fuel-Oil Engine; Longitudinal Section, End Elevation, and Sections of Details; Views of Three-Cylinder Engine on Test Bed and of Governor Gear and Fuel Pumps of Six-Cylinder Engine (Davey, Paxman & Co., Ltd.) (between pages 224 and 225)

XXIX. British Industries Fair, Birmingham: Views of Semi-Diesel Oil Engine (Fielding & Platt, Ltd.); of Solid-Injection Heavy-Oil Engine (Robey & Co., Ltd.); and of Electrically-Driven Cold-Storage Unit and Cold-Storage Compressor (R. Boby, Ltd.) (facing page 225)

XXX. Harbour Works, Port of Bari, Southern Italy: Views of Silo Building; of Vessel Discharging Pozzuolana; of Telpher Feeding Line of Moulds; of Outer Breakwater in Course of Construction; of Elevator; and of Land Transporter for Blocks (Sindicato Italiano Construzioni Appalti Marittimi) (between pages 246 and 247)

PLATE

XXXI. Leipzig Fair Exhibits: Views of Horizontal Boring and Drilling Machine (Karl-Wetzel Maschinenfabrik); of Nut-Making Machine (G. Wuttig); of 500-ton Forging Press (Eumuco A.G.); and of Automatic Wire-Forming Machine (C. Semper) (facing page 282).

XXXII. Leipzig Fair Exhibits: Front and End Elevation of Turret Lathe (Max Hasse A.G.); Views of 1,000-mm. Surface Grinder (Naxos Union); and of High-Speed Lathe (Schiess-Defries A.G.) (between pages 282 and 283)

XXXIII. Leipzig Fair Exhibits: Views of Horizontal Boring and Milling Machine (Collet & Engelhard); of Box-Nailing Machine (W. Friedenhagen); of 200-ton Spring Press (Berliner Erfurter H. Pels A.G.); and of Semi-Automatic Wheel Lathe (W. Hegenscheidt) (between pages 282 and 283)

XXXIV. Leipzig Fair Exhibits: Views of High-Speed Riveter (Max Hasse A.G.); of Magnetic Separator (Magnet-Werk); of Oil-Engine Shunting Locomotive (Berliner Maschinenbau A.G.); of Diesel-Engine Road Roller (J. Kemma); and of Road Roller with Steam-Operated Scarifier (Berliner Maschinenbau A.G.) (facing page 283)

XXXV. Locomotive, Electric, 4-6-4 Type Express Passenger, Great Indian Peninsula Railway: Elevation; Views of Main Motors; of Pantograph Current Collector; and of Part of Main Controller (between pages 298 and 299)

XXXVI. Engine, Steam Compound, 800-h.p. Heat-Extraction Uniflow Type: Elevation and Plan; and Section through Low-Pressure Cylinder (Galloways, Ltd.) (between pages 318 and 319)

XXXVII. Locomotive, 4-8-4 Type for the Canadian National Railways: Longitudinal Elevation; End Elevations; and Transverse Sections (Canadian Locomotive Co., Ltd.) (between pages 346 and 347)

XXXVIII. Motor Ship "Greystoke Castle," Machinery of; Front Elevation and Cross-Section of Engine; Elevation, Plan and Sections of Machinery Space (North Eastern Marine Engineering Co., Ltd.) (between pages 380 and 381)

XXXIX. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views showing Building of Flexible Mica Insulation; of Insulation Machine Shop; of Straight Bars and Coils for Turbo-Alternators; and of Haefely-Type Hot-Ironing Machine (facing page 404)

XL. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Hot-Ironing Machines and Presses in Turbo-Coil Department; of Presses in Dip Shop; and of Coil-Assembly Department (facing page 405)

XLI. Niagara Falls, Preservation of: Aerial View taken above Horseshoe Falls; Views showing Uncovered Rocks on Horseshoe Falls (facing page 418)

XLII. Niagara Falls, Preservation of: Aerial Views of Falls showing Crest Line at Dates of Various Surveys; and showing Proposed Excavation and Submerged Weirs (facing page 419)

XLIII. Trenton Channel Power Station, Detroit, Michigan, U.S.A.: Sections of Coal-Preparation House (between pages 434 and 435).

XLIV. Sydney Harbour Bridge, Sydney, N.S.W.: Elevation; Views of Retaining Wall along Hickson Road; of Abutment Tower and Southern Approach at Dawes Point; of Piers at Dawes Point; of Approach Piers at Milson's Point; and of Abutment Tower at Dawes Point (between pages 468 and 469)

PLATE

XLV. Trenton Channel Power Station, Detroit, Michigan, U.S.A.: Views of Boiler Steam Drums; of Liptak Arch in Combustion Chamber; of Bottom Drums and Superheater Headers; and of Interior of Main Boiler (facing page 500)

XLVI. Trenton Channel Power Station, Detroit, Michigan, U.S.A.: Sections through Boiler Plant (between pages 500 and 501)

XLVII. Trenton Channel Power Station, Detroit, Michigan, U.S.A.: Views of Water Screen and Refractory Bottom; of Bends in Water-Screen Tubes; of Tubes of Water-Screen Units; and of Steam Drum of Water-Screen Unit (facing page 501)

XLVIII. Royal Tweed Bridge, Berwick: Elevations and Sections of Main Ribs; Details of Secondary Beams and Piers (L. G. Mouchel & Partners, Ltd.) (between pages 536 and 527)

XLIX. Royal Tweed Bridge, Berwick: General View of Bridge Looking S.E.; View of Centring and Shuttering for the 167-ft. Span (L. G. Mouchel & Partners, Ltd.) (facing page 528)

L. Royal Tweed Bridge, Berwick: View of Construction of Ribs for 167-ft. Span; of Abutment Pier for 167-ft. Span; of Hollow-Rib Construction on the 285-ft. Span; and of Reinforcing Rods Tying Ribs to Concrete Pier (L. G. Mouchel & Partners, Ltd.) (facing page 529)

LI. Trenton Channel Power Station, Detroit, Michigan, U.S.A.: Views of Economiser Units in Course of Erection; of Precipitator Housing and Stacks; of Dust Precipitators in Course of Erection; and of Precipitator Substation (facing page 534)

LII. Trenton Channel Power Station, Detroit, Michigan, U S A: Views of Boiler Aisle; of Superheated-Steam Header Casting; and of Pressure-Reducing Station (facing page 535)

LIII. Royal Edward Dock Extension, Avonmouth: Aerial View of Dock and Eastern Extension Arm (facing page 566)

LIV. Royal Edward Dock Extension, Avonmouth: Views of Bucket Dredger Working on Temporary Earth Dam; of Hopper Barge being Emptied by Reclamation Plant; of Concrete Pile-Making Yard; and of Pile Driving in Progress (between pages 566 and 567)

LV. Royal Edward Dock Extension, Avonmouth: Views of Wharf Frame; and of Wharf under Construction showing Steel Shuttering for Frames (between pages 566 and 567)

LVI. Royal Edward Dock Extension, Avonmouth: View under Wharf showing Reinforced-Concrete Frames; Views of Extension Arm before Admission of Water; of Ground Floor of Transit Shed "U"; and of Gallery in Front of Transit Granary (facing Plate LVII)

LVII. Royal Edward Docks Extension, Avonmouth: Details of Wharf Frames and Decking; Details of Barge Jetty (facing Plate LVI)

LVIII. Royal Edward Dock Extension, Avonmouth: Elevation, Longitudinal Section, Plan and Details of Reinforced-Concrete Transit Sheds (between pages 566 and 567)

LIX. Royal Edward Dock Extension, Avonmouth: Sections of 20,000-ton Reinforced-Concrete Storage Granary (facing page 567)

LX. Royal Edward Dock Extension, Avonmouth: Views of Junction between Two and Four Band Conveyors in Conveyor Gallery; and of Junction between Band Conveyors in Gallery and Transverse Conveyors at Transit Granary (H. Simon & Co., Ltd.) (facing page 594)

PLATE

LXI. Royal Edward Dock Extension, Avonmouth: Views of Band Conveyors over Silos in Storage Granary; of Band Conveyors under Silos in Eastern Wing of Transit Granary; of Weighing Machines and Band Conveyors for Barge Loading at Transit Granary; and of Band Conveyors in Gallery between Transit and Storage Granaries (facing page 595)

LXII. Royal Edward Dock Extension, Avonmouth: Mechanical Equipment of Transit and Storage Granaries (H. Simon, Ltd.) (between pages 596 and 597)

LXIII. Trenton Channel Power Station, Detroit, Michigan, U.S.A.; Views of Turbine Room and of 50,000-kw. Set (facing page 604)

LXIV. Trenton Channel Power Station, Detroit, Michigan, U.S.A.: Views of Original and Improved Arrangements of Governor, &c.; of Worm Drive and Thrust Bearing; and of Worm Drive for Oil Pump (facing page 605)

LXV. Napier Lion Aero-Engine for Schneider Trophy Race: Longitudinal Section (D. Napier & Son, Ltd.) (between pages 632 and 633)

LXVI. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of 13-ft. Diameter Gear-Hobbing Machine; of Heavy Planing Machine; of Semi-Portable Radial Drill on Work-Plate; and of Horizontal Boring, Facing and Milling Machine (facing page 656)

PLATE

LXVII. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Portable Adjustable Drilling Machine; of Condenser Tube-Plate Drilling Machine; of Heavy Vertical Boring Mill; and of Machine for Dynamic Balancing of Turbine Rotors (between pages 656 and 657)

LXVIII. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Condenser Erection Section; of Small Surface Condenser and Auxiliaries; of Two-Stage Steam-Operated Air Ejectors; and of Completed 35,000-kw. Turbine on Test Bed (between pages 656 and 657)

LXIX. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Marine Turbine with Single Reduction Gear; and of Machines for Engine Details (facing page 657)

LXX. Trenton Channel Power Station, Detroit, Michigan, U.S.A.: Sections of Screen House; Details of Circulating-Water System at Turbine Room (facing page 690)

LXXI. Trenton Channel Power Station, Detroit, Michigan, U.S.A.; Views of Screen-House Substructure and of Interior of Screen House during Construction; of Circulating-Water Discharge into Drainage Canal; and of Double-Level Circulating-Water Canal (facing page 691)

LXXII. Sydney Harbour Bridge, Tests of Structural Members: Views of 1,250-ton Avery Universal Testing Machine; and of Crippling of Compression-Post Model at 855 Tons (Dorman, Long & Co., Ltd.) (facing 698)

PLATE

LXXIII. Sydney Harbour Bridge, Tests of Structural Members: Views of Buckling of Flange of Compression-Post Model; of Failure of Tension Diagonal at 513 Tons; of Parts of Tension Diagonal Separated after Failure; and of Wire Rope after Failure at 364 Tons (Dorman, Long & Co. Ltd.) (facing page 699)

LXXIV. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Alternator Rotor being Slotted in 10-ft. Planing Machine; of Vertical Boring Mill with Centre Spindle; of Double-Table Planing Machine; and of Churchill Shaft-Grinding Machine (facing page 730)

LXXV. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Alternator Rotor in Process of being Wound; of Completely-Finished Alternator Rotor in Lathe; of Alternator Rotor with Press Rings on Completed Winding; and of 43,750-kv.-a. Alternator Rotor in Lathe (between pages 730 and 731)

LXXVI. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Stator for 12,500-h.p. Direct-Current Winding Motor; and of Vertical-Type Water-Wheel Alternator on Electrical Test Bed (between pages 730 and 731)

LXXVII. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of 43,750-kv.-a. Turbo-Alternator on Electrical Test Bed; and of Flywheel Motor-Generator Set for Colliery-Winding Installation (facing page 731)

PLATE

LXXVIII. Lanarkshire Hydro-Electric Power Scheme: Section of Stonebyres Installation; Plan and Sections of Intake and Tilting Weir; Details of Surge Tank and of Tunnel Segments (between pages 768 and 769)

LXXIX. Lanarkshire Hydro-Electric Power Scheme: Elevations, Plan and Sections of Hydraulic Turbines and Generators; Arrangement of Gate-Control Apparatus; Section of Main Stop Valve (English Electric Co., Ltd.) (between pages 792 and 793)

LXXX. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Train-Lighting, Railway-Signalling and Point-Operating Apparatus Department; of Assembly of Traction-Control Gear; of Meter Machine Shop; and of Meter-Testing Department (facing page 814)

LXXXI. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Contactor-Type Control Board for Rolling Mill; of 1,500-volt Direct-Current Truck-Type Switchboard; of Desk-Type Switchboard; of Cam-Operated Controller for Variable-Speed Motors; of Industrial Electric Furnace and Conveyor; and of Motor-Operated 50,000-volt Air-Break Isolating Switch (between pages 814 and 815)

LXXXII. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd., Manchester: Views of Switchgear Assembly (between pages 814 and 815)

LXXXIII. Works of Messrs. Metropolitan-Vickers Electrical Co., Ltd, Manchester: Views of Metal-Clad Switchgear for Portobello Power Station (facing page 815)

LETTERS TO THE EDITOR.

(Illustrated Subjects are Marked with an Asterisk after the Number of the Page.)

AIR] Preheating for Marine Boilers. A. Macfarlane, 351
Aircraft in Naval Warfare. E. F. Spanner, 771
Alternating-Stress Tests, Cast Iron. See *Cast Iron*
Assessment of Industrial Premises and Plant for Rating. J. E. Grant, 258

BOILERS, Marine, Air Preheating for. A. Macfarlane, 351
Bridge, Charing Cross, Proposed Double-Deck Design, Acoustic Properties. A. L. Forster, 738
British Industries Fair, Criticisms of Arrangements. A. L. Johnson, for Rd. Johnson, Clapham & Morris, Ltd., 299

CARBONISATION, Low-Temperature. See *Coal*
Cast Iron, Fatigue Tests of. J. G. Pearce, 14; C. H Bulleid, 142
Charing Cross Bridge, Proposed Double-Deck Design, Acoustic Properties. A. L. Forster, 738
China, Machinery Imports. G. W. Cockburn, 174
Coal, Low-Temperature Carbonisation Processes, Development of. D. Brownlie, 738
Collieries, Wire Ropes for, Federation of Manufacturers. E. J. W. Buckpitt, 645
Commercial Motor Vehicles, Semi-Pneumatic Tyres for. M. S. Lombardini, for Pirelli, Ltd., 351

DIESEL Engines. See *Engines*

ELECTRIC Power Stations, Use of Heavy-Oil Engines. E. G. Pink, 540
Electrical Machinery, Measuring Moments of Inertia of Rotors. H. W. Ritchie, 614
Engineering and Science. E. N. da C. Andrade, 227
Engines, Heavy-Oil, Use in Electric Power Stations. E. G. Pink, 540
Exhibition, British Industries Fair, Criticisms of Arrangements. A. L. Johnson, for Rd. Johnson, Clapham & Morris, Ltd., 299
Exhibitions, Trade, British, German Machine Tools at. H. M. Selson, for the Selson Engineering Co., Ltd., 382

FACTORIES, Assessment for Rating. J. E. Grant, 258
Fatigue Tests of Cast Iron. See *Cast Iron*
Floods, River Thames, London, Early Records. G. M. Meyer, 74
Fuel Research Board and the Development of Low-Temperature Carbonisation Processes. D. Brownlie, 738

GERMAN Machine Tools at British Trade Exhibitions. H. M. Selson, for The Selson Engineering Co., Ltd., 382
Goods by Passenger Train, Charges for. G. E. Frost, for Barimar, Ltd., 645
Government Appointments, Allowance for Travelling Expenses. "Bachelor," 615

HELICAL Springs, Avoiding Permanent Set in. C. H. Wingfield, 711*

INDUSTRIAL Premises and Plant Assessment for Rating. J. E. Grant, 258
Internal-Combustion Engines. See *Engines*
Iron, Cast, Fatigue Tests of. See *Cast Iron*

LONDON, Charing Cross Bridge, Proposed Double-Deck Design, Acoustic Properties. A. L. Forster, 738
London, Post Office Tube Railway. A. R. Bennett, 299
London, River Thames, Early Flood Records. G. M. Meyer, 74
Low-Temperature Carbonisation. See *Coal*

MACHINE Tools, German, at British Trade Exhibitions. H. M. Selson, for the Selson Engineering Co., Ltd., 382
Machinery, Electrical, Measuring Moments of Inertia of Rotors. H. W. Ritchie, 614
Machinery Imports, China. G. W. Cockburn, 174
Machinery, Industrial, Assessment for Rating. J. E. Grant, 258
Mails, Underground Railway for, London. A. R. Bennett, 299
Marine Boilers, Air Preheating for. A. Macfarlane, 351
Mines, Wire Ropes for, Federation of Manufacturers. E. J. W. Buckpitt, 645
Moments of Inertia, Rotors of Electrical Machinery, Measuring. H. W. Ritchie, 614
Motor Ships, Vibration of. J. L. Taylor, 227
Motor Vehicles, Commercial, Semi-Pneumatic Tyres for. M. S. Lombardini, for Pirelli, Ltd., 351
Museum, Science, South Kensington, Treatment of Officials. "Scientist," 382

NAVAL Warfare, Aircraft in. E. F. Spanner, 771
Nozzles. Research Committee, Use of Work. Brown, Boveri & Co., Ltd., 174

OIL Engines. See *Engines*

PASSENGER Train, Charges for Goods by. G. E. Frost, for Barimar, Ltd., 645
Permanent Set in Helical Springs, Method of Avoiding. C. H. Wingfield, 711*
Plant, Industrial, Assessment for Rating. J. E. Grant, 258
Pneumatic Tyres for Commercial Vehicles. M. S. Lombardini, for Pirelli, Ltd., 351
Post Office Tube Railway, London. A. R. Bennett, 299
Power Stations, Electric, Use of Heavy-Oil Engines. E. G. Pink, 540
Preheating, Air, for Marine Boilers. A. Macfarlane, 351
Premises, Industrial, Assessment for Rating. J. E. Grant, 258

RAILWAY Transport, Charges for Goods by Passenger Train. G. E. Frost, for Barimar, Ltd., 645
Railway, Underground, for Mails, London. A. R. Bennett, 299
Rating, Assessment of Industrial Premises and Plant for. J. E. Grant, 258
Research Board, Fuel, and the Development of Low-Temperature Carbonisation Processes. D. Brownlie, 738
Research Committee. Steam Nozzles, Use of Work. Brown, Boveri & Co., Ltd., 174
River Thames, London, Early Flood Records. G. M. Meyer, 74
Ropes, Wire, Federation of Manufacturers. E. J. W. Buckpitt, 645
Rotors, Electrical Machinery, Measuring Moments of Inertia. H. W. Ritchie, 614

SCIENCE and Engineering. E. N. da C. Andrade, 227
Science Museum, South Kensington, Treatment of Officials. "Scientist," 382
Semi-Pneumatic Tyres, for Commercial Motor Vehicles. M. S. Lombardini, for Pirelli, Ltd., 351
Ships, Vibration of. J. L. Taylor, 227
South Kensington Science Museum, Treatment of Officials. "Scientist," 382
Springs, Helical, Avoiding Permanent Set in. C. H. Wingfield, 711*
Steam Nozzles Research Committee, Use of Work. Brown, Boveri & Co., Ltd., 174

TESTS, Fatigue, of Cast-Iron. See *Cast Iron*
Thames, River, London, Early Flood Records. G. M. Meyer, 74
Trade Exhibition, British Industries Fair, Criticisms of Arrangements. A. L. Johnson, for Rd. Johnson, Clapham & Morris, Ltd., 299
Trade Exhibitions, British, German Machine Tools at. H. M. Selson, for the Selson Engineering Co., Ltd., 382
Trade, Machinery Imports, China. G. W. Cockburn, 174
Transport, Railway, Charges for Goods by Passenger Train. G. E. Frost, for Barimar, Ltd., 645
Travelling Expenses, Government Appointments, Allowance for. "Bachelor," 615
Tube Railway, Post Office, London. A. R. Bennett, 299
Turbines, Steam, Nozzles Research Committee, Use of Work. Brown, Boveri & Co. Ltd., 174
Tyres, Semi-Pneumatic, for Commercial Motor Vehicles. M. S. Lombardini, for Pirelli Ltd., 351

UNDERGROUND Railway for Mails, London. A. R. Bennett, 299

VALUATION of Industrial Premises and Plant for Rating. J. E. Grant, 258
Vibration of Ships. J. L. Taylor, 227

WARFARE, Naval, Aircraft in. E. F. Spanner, 771
Wire Ropes, Federation of Manufacturers. E. J. W. Buckpitt, 645

LITERATURE.

ACTIVATED Sludge-Process, by A. J. Martin, 603
Aerodynamics in Aeroplane Design, by E. P. Warner, 371
Aeronautical and Naval Architects and Engineers, French Association, Bulletin, 194
Aeronautics, Aeroplane Design, Aerodynamics, by E. P. Warner, 371
Aeronautics, Aircraft, British Corporation Register Book, 195
Aeronautics, Aircraft in Naval Warfare, by E. F. Spanner, 692. See LETTER, 771
Aeronautics, All the World's Aircraft, 1927, 24
Aeronautics, Flying for Air Survey Photography, by F. Tymms and Flight-Lt. C. Porri, 141
Aeronautics, Surveying from Air Photographs, by Lieut. M. Hotine, 194
Aeronautics, The Old Flying Days, by Major Turner, 11
Aeroplane Design, Aerodynamics, by E. P. Warner, 371
Aeroplanes and Aeroplane Engines, German, Edited by C. W. E. Meyer, 361
Africa, South and East, Year Book, 74
Agriculture, Electricity in, by R. B. Matthews 693
Air Photographs, Surveying from, by Lieut. M. Hotine, 194
Air Survey Photography, Flying for, by F. Tymms, and Flight.-Lieut. C. Porri, 141
Aircraft, All the World's 1927, 24
Aircraft, British Corporation Register Book, 195
Aircraft in Naval Warfare, by E. F. Spanner, 692. See LETTER, 771
All the World's Aircraft, 1927, 24
Almanacks and Calendars, 24, 52, 142
Alternating Stress, Fatigue of Metals, by H. F. Moore and J. B. Kommers, 370
American Ship Types, by A. C. Hardy, 162
American Society for Testing Materials, Proceedings at French Lick Meeting, 530
Annuals and Year Books, 24, 52, 73, 142, 195
Anuario de Mineral, Metalurgia, Electricidad y demas Industrias de España, 1927, 73
Applied Chemistry, Dictionary of, Vol. VII, Edited by Dr. H. F. Morley, 163
Applied Thermodynamics, by W. Robinson, 780
Armaments and the Non-Combatant, by E. F. Spanner, 692. See LETTER, 771
Association Technique Maritime et Aeronautique, Bulletin, 194
Atlas Metallographicus, by Prof. H. Hanemann and Miss A. Schrader, 194
Auctioneers' Press Guide, 142
Aufbau des Mörtels und des Betons, by O. Graf, 286
Austrian Mining Industry Year Book, 1927, 74

BAU des Dieselmotors, by Prof. K. Körner, 173
Bauteile der Dampfturbinen, by Dr. Ing. G. Karrass, 666
Biology, Collected Papers of Sir J. C. Bose, 141
Blue Book, Electrical Trades, 1928, 195
Boilers, Feed-Water Heating by Waste Gases from, by C. Ruhl, 472
Books, Mechanical Engineering, Catalogue, 400
Books, New, Notes on, 10, 162, 193, 361, 456, 548, 666, 813
Books Received, 14, 74, 166, 196, 258, 290, 320, 352, 414, 446, 478, 510, 540, 606, 638, 668, 772, 804
Boreholes, Oil, and the Exclusion of Water, by B. Schweiger, 162
Bose, Sir J. C., Collected Physical Papers of, 141
Botany, Collected Papers of Sir J. C. Bose, 141
Bradshaw's Railway Guide, 618
Bridge Building, by Dr. J. Melan, 83
British Corporation Register Book, Shipping and Aircraft, 195
British and Dominions Trades' Directory, 724
British Engineering Wages, by R. S. Spicer, 563
British Journal Photographic Almanac, 195
British Rainfall, 1926, 548
British West Indies Year Book, 1928, 558
Broadcasting, B.B.C. Handbook, 24
Brückenbau, Eiserne Brücken, by Dr. J. Melan, 83
Building of Twelve Thousand Houses, 456
Buildings, Constructional Steelwork Simply Explained, by Dr. O. Faber, 548
Bulletin de l'Association Technique Maritime et Aeronautique, No. 31, Session de 1927, 194
Buyers, Foreign, Directory, 550

CALCULATION Simplified, by M. d'Ocagne, 813
Calendars and Almanacs, 24, 52, 142
Carbonisation, Low-Temperature, of Coal, by R. Courau and H. Besson, 517
Casting and Moulding by C. Irresbeger, 10
Cement Mortars and Concretes, Proportioning and Mixing, by O. Graf, 286
Chemical Engineering and Chemical Catalogue, 555
Chemistry, Applied, Dictionary of, Vol. VII, Edited by Dr. H. F. Morley, 163
Chemistry, Higher Coal-Tar Hydrocarbons, by Dr. A. E. Everest, 372
Civil Engineering, Standard Construction Methods, by G. Underwood, 780.
Classification of Aircraft and Shipping, British Corporation Register Book, 195
Clubs, Directory of, 142
Coal, Iron and Allied Trades, Rylands' Directory, 142
Coal, Low-Temperature Carbonisation, by R. Courau and H. Besson, 517
Coal-Tar Hydrocarbons, The Higher, by Dr. A. E. Everest, 372
Coal, Working of, by H. F. Bulman, 346
Cold Storage and Ice Trades Directory, 52
Collieries, Working of Coal, by H. F. Bulman, 346
Colliery Guide, Reid's 614
Colliery Shafts, Vertical, Sinking, by E. O. F. Brown, 528
Colliery Winding Engines, Electrical, Design, Construction and Operation, by H. H. Broughton, 694
Colliery Year Book, 1928, 368
Columbia and its Possibilities, 415
Concrete Products, by H. L. Childe, 361
Concrete Year Book, 196
Concretes and Cement Mortars, Proportioning and Mixing, by O. Graf, 286
Conductors, Stranded-Copper, B. I. Tables, 148
Construction, Standard Methods, by G. Underwood, 780
Constructional Steelwork Simply Explained, by Dr. O. Faber, 548
Contractors, Directory of, and Public Works Annual, 368
Copper Conductors, Stranded, B. I. Tables, 148
Cost Estimating and Design of Merchant Ships, by A. Kari, 34
Crane Construction and Calculations, by Dr. R. Dub, 194
Cutting and Stamping, by E. Göhre, 194

DEPRECIATION, Valuation and the Rate Base, by Dr. C. E. Grunsky, 693
Design, Structural, Problems in, by Prof. Bishop, 456
Deutsche Kraftfahrzeug-Typenschau, Ausgabe 1 : Luftfahrzeuge und Luftfahrzeugmotoren, Edited by C. W. E. Meyer, 361
Diaries and Pocket Books, 24, 52, 142, 196
Dictionary of Applied Chemistry, Vol. VII, Edited by Dr. H. F. Morley, 163
Diesel Engines, Running, Maintenance and Repairs, by P. H. Smith, 548
Directory of Clubs, 142
Directory, Coal, Iron and Allied Trades, Ryland's, 142
Directory of Contractors and Public Works Annual, 368
Directory, Foreign Buyers', 550
Directory and Handbook, Electrical Engineering and Allied Trades, 195
Directory, Ice and Cold Storage Trades, 52
Directory, Kelly's, Merchants, Manufacturers and Shippers of the World, 813
Directory of Shipowners, Shipbuilders and Marine Engineers, 196
Directory, Trades, British and Dominions, 724
Directory, Universal, Railway Officials, 677
Distillation des Combustibles à Basse Température, by R. Courau and H. Besson, 517
Docks, Southampton, 268
Dredging and Dredging Appliances, by P. M. Dekker, 141
Drinking Water, Microscopy of, by G. C. Whipple, 780

EAST African Year Book, 74
Economics, Industrial, Modern Wages, by F. Bayle, 346
Economisers, Feed-Water Heating, by C. Ruhl, 472
Education, Science Teaching in England, History of, by Miss D. M. Turner, 361
Elasticity of Materials, Examples in, by G. W. Bird, 548
Electric Conductors, Stranded-Copper, B. I. Tables, 148
Electric, Mercury-Arc Rectifiers and their Circuits, Principles of, by D. C. Prince, and F. B. Vodges, 173
Electric Power Transmission Engineering, by W. T. Taylor, 344
Electric Rectifiers and Valves, by Prof. A. Güntherschulze, 472
Electric, Telephone Transmission, Elements of, by H. H. Harrison, 456
Electric Winders, by H. H. Broughton, 694
Electrical Design, Fundamentals of, by Prof. A. D. Moore, 564
Electrical Engineering and Allied Trades, Directory and Handbook, 195
Electrical Engineering and Scientific Research, Interaction, by Dr. J. A. Fleming, 286
Electrical Machinery, Principles of Design, by W. I. Slichter, 141
Electrical Pocket Book, Mechanical World, 52
Electrical Rules and Tables, Munro and Jamieson's Pocket Book, 361
Electrical Supply and Communication Lines, Safety Rules for Installation and Maintenance, United States Bureau of Standards, 456
Electrician Annual Tables of Electricity Undertakings, 666
Electricity, Physico-Technical, by Prof. F. F. Martens, 530
Electricity Undertakings, Electrician Annual Tables, 666
Electro-Farming, by R. B. Matthews, 693
Engineering, Application of Thermodynamics to, by A. F. Macconochie, 529
Engineering, Civil, Standard Construction Methods, by G. Underwood, 790
Engineering, Electrical, and Scientific Research, Interaction, by Dr. J. A. Fleming, 286
Engineering, Marine, Rules and Tables, Seaton & Rounthwaite's Pocket Book of, 11
Engineering, Mathematics of, by Dr. R. E. Root, 666
Engineering, Mechanical, Catalogue of Books, 400
Engineering, Motive Power, by H. C. Harris, 361
Engineering Standards Association, Standard Specifications, Index, 429
Engineering, Wages, British, by R. S. Spicer, 563
Engineering Wonders, Wonder Book of, Edited by H. Golding, 163
Engineers, Marine, Directory of, 106
Engines, Aeroplane, German Types, Edited by C. W. E. Meyer, 361
Engines, Diesel, Running, Maintenance and Repairs, by P. H. Smith, 548
Engines, Heat, Applied Thermodynamics, by W. Robinson, 780
Engines, Oil, Diesel, Marine and Stationary, Design and Construction, by Prof. K. Körner, 173
Engines, Oil, Marine, Design of Small Vessels, by W. Pollock, 173
Engines, Steam, for Marine Propulsion, History of, by G. G. Jackson, 193
Engines, Steam, Work of James Watt, by H. W. Dickinson and R. Jenkins, 82
Engines, Winding, Electrical, Design, Construction and Operation, by H. H. Broughton, 694
Entropy and Probability, Lectures at the University of Leiden, by Prof. H. A. Lorentz, 813
Estimating, Cost, and Design of Merchant Ships, by A. Kari, 34
European War, Italian Navy in, 83
Exponentials Made Easy, by G. de Bray, 162

FARMING, Use of Electricity in, by R. B. Matthews, 693
Fatigue of Metals, by H. F. Moore and J. B. Kommers, 370
Feed-Water Heating by Waste Gases from Boilers, by C. Ruhl, 472
Flying for Air-Survey Photography, by F. Tymms and Flight-Lieut. C. Porri, 141
Flying, the Old Days, by Major Turner, 11
Foreign Buyers' Directory, 550
Foremanship and Supervision, by F. Cushman, 666
Formen und Geissen, by C. Irresberger, 10
Foundry Work, Moulding and Casting, by C. Irresberger, 10
French Lick Meeting, American Society for Testing Materials, Proceedings, 530

GAUGING Flow of Streams, by W. A. Liddell, 564
Generators, Electric, Fundamentals of Design, by Prof. A. D. Moore, 564
Generators, Electric, Principles of Design, by W. J. Slichter, 141
Geology of the Rossendale Anticline, 456
German Aeroplanes and Aeroplane Engines, Edited by C. W. E. Meyer, 361
Great Western Railway Ports, 11

HAMBURG, Port of, Development, 805
Hardening Steel, Instruction in, by Schiefer and Grün, 666
Hauts Salaires, Les, by F. Bayle, 346
Heat Treatment of Steel, by D. K. Bullens, 517
Heating Feed Water by Waste Gases from Boilers, by C. Ruhl, 472
Hoists, Mine, Electrical, Design, Construction and Operation, by H. H. Broughton, 694
Houses, Building of Twelve Thousand, 456
Humber Ports, 111
Hydraulics, by E. W. Schoder and F. M. Dawson, 530
Hydraulics, Stream Gauging, by W. A. Liddell, 564
Hydrocarbons, Coal-Tar, The Higher, by Dr. A. E. Everest, 372

ICE and Cold Storage Trades Directory, 52
Industrial Economics, Modern Wages, by F. Bayle, 346
Industrial Housing Association, Work of, 456
Industry, British Engineering, Wages in, by R. S. Spicer, 563
Inventors, Advice to, 212
Iron, Coal, and Allied Trades, Ryland's Directory, 142
Iron and Coal Trades Review, Jubilee Issue, 104
Iron and Steel, Metallographical Atlas, by Prof. H. Hanemann and Miss A. Schrader, 194
Italian Navy in the World War, 83

KELLY'S Directory of Merchants, Manufacturers and Shippers of the World, 813
Kranbau, Berechnung und Konstruktion von Kranen aller Art, by Dr. Techn. R. Dub, 194

LABOUR, Modern Wages, by F. Bayle, 346
Labour, Trade Unions and the Law, by A. Henderson, 564
Labour, Wages, British Engineering, by R. S. Spicer, 563
Law Courts, Naval History in, by W. Senior, 517
Le Calcul Simplifié, by M. d'Ocagne, 813
Legal, Naval History in the Law Courts, by W. Senior, 517
Legal, Trade Unions and the Law, by A. Henderson, 564
Legal, Valuation and Depreciation and the Rate Base, by Dr. C. E. Grunsky, 693
Lehrgang der Hartetechnik, by Schiefer and Grün, 666
Leiden, University of, Lectures on Theoretical Physics, by Prof. H. A. Lorentz, 813
London, Midland & Scottish Railway, Railhead Storage and Distribution, 505
London Underground Railway and Omnibus Guide, 813
Low-Temperature Carbonisation of Coal, by R. Courau and H. Besson, 517

MACHINE Design, Elements of, by Prof. W. C. Unwin, 163
Machines, World of, by P. M. Baker, 10
Machinery, Electrical, Fundamentals of Design, by Prof. A. D. Moore, 564
Machinery, Electrical, Principles of Design, by W. J. Slichter, 141
Machinery, Vibration of, by Dr. J. Geiger, 34
Manufacturers, Merchants and Shippers of the World, Kelly's Directory, 813
Mapping from Aerial Photographs, by Lieut. M. Hotine, 194
Marine Engineering Rules and Tables, Seaton and Rounthwaite's Pocket Book of, 11
Marine Engineers, Directory of, 196
Marine Propulsion, Diesel Engines, Design and Construction, by Prof. K. Körner, 173
Marine Propulsion, Small Oil-Engined Vessels, Designs of, by W. Pollock, 173
Marine Propulsion, The Ship under Steam, by G. G. Jackson, 193
Materials, Strength of, by Dr. F. V. Warnock, 471
Materials, Strength and Elasticity, Examples in, by G. W. Bird, 548

Mathematics, Calculation Simplified, by M. d'Ocagne, 813
Mathematics of Engineering, by Dr. R. E. Root, 666
Mathematics, Exponentials Made Easy, by G. de Bray, 162
Mathematics for Students of Technology, by L. B. Benny, 11
Mechanical Engineering Books, Catalogue, 400
Mechanical Vibrations, by Dr. J. Geiger, 34
Mechanical World Electrical Pocket Book, 52
Mechanische Schwingungen, by Dr. J. Geiger, 34
Merchant Ships, Design and Cost of, by A. Kari, 34
Merchants, Manufacturers and Shippers of the World, Kelly's Directory, 813
Mercury-Arc Rectifiers and their Circuits, Principles of, by D. C. Prince and F. B. Vodges, 173
Metallographical Atlas, Iron and Steel, by Prof. H. Hanemann and Miss A. Schrader, 194
Metallurgy, Hardening, Course of Instruction, by Schiefer and Grün, 666
Metallurgy, Heat Treatment of Steel, by D. K. Bullens, 517
Metals, Fatigue of, by H. F. Moore and J. B. Kommers, 370
Meteorology, British Rainfall, 1926, 548
Microphotographs, Iron and Steel, Metallographical Atlas, by Prof. H. Hanemann and Miss A. Schrader, 194
Microscopy of Drinking Water, by G. C. Whipple, 780
Mine Shafts, Vertical, Sinking of, by E. O. F. Brown, 528
Mine-Winding Engines, Electrical, Design, Construction and Operation, by H. H. Broughton, 694
Minerals, Stratified, Working of, by H. F. Bulman, 346
Mining Coal and other Stratified Minerals, by H. F. Bulman, 346
Mining Industry, Austrian, Year Book, 1927, 74
Mining and Industrial Year Book, Spanish, 73
Mining Science, Elements of, by D. E. Thomas, 193
Mortars, Cement, and Concretes, Proportioning and Mixing, by O. Graf, 286
Motive-Power Engineering, by H. C. Harris, 361
Motor Ship Manual, Edited by A. C. Hardy, 813
Motor-Ship Reference Book, 73
Motor Ships, Small, Design of, by W. Pollock, 173
Motor Trade Register, 573
Motors, Electric, Fundamentals of Design, by Prof. A. D. Moore, 564
Motors, Electric, Principles of Design, by W. J Slichter, 141
Moulding and Casting, by C. Irresberger, 10
Munro and Jamieson's Pocket Book of Electrical Rules and Tables, 361

NAVAL and Aeronautical Architects and Engineers, French Association, Bulletin, 194
Naval Architecture, American Ship Types, by A. C. Hardy, 162
Naval History in the Law Courts, by W. Senior, 517
Naval Warfare, Aircraft in, by E. F. Spanner, 692. See LETTER, 771
Navy, Italian, in the World War, 83

OESTERREICHISCHES Montan-Handbuch, 1927, 74
Oil Engines. See *Engines, Oil*
Oil-Well Boring and the Exclusion of Water, by B. Schweiger, 162
Oilfield, Persian, by J. W. Williamson, 456
Overhead Electric Power Transmission Engineering, by W. T. Taylor, 344
Overhead Lines, Safety Rules, United States Bureau of Standards, 456

PATENTS, What's Wanted, and Advice to Inventors, 212
Petroleum Wells, Boring, and the Exclusion of Water, by B. Schweiger, 162
Photographic Aerial Surveying, Flying for, by F. Tymms and Flight-Lieut. C. Porri, 141
Photographic Almanac, British Journal, 195
Physics, by Prof. O. D. Chwolson, 602
Physics, Collected Papers of Sir J. C. Bose, 141
Physics, Spectroscopy, by Prof. E. C. C. Baly, 371
Physics, Theoretical, Lectures at the University of Leiden, by Prof. H. A. Lorentz, 813
Physicists, the Great, by Dr. F. B. Hart, 666
Physik, Die, by Prof. O. D. Chwolson, 602
Physikalisch-technische Elektricitätslehre, by Prof. F. F. Martens, 530
Physiology, Collected Papers of Sir J. C. Bose, 141
Persian Oilfield, by J. W. Williamson, 456
Pocket Book, Electrical, Mechanical World, 52
Pocket Book of Electrical Rules and Tables, Munro and Jamieson's, 361
Pocket Book of Marine Engineering Rules and Tables, Seaton and Rounthwaite's, 11
Pocket Books and Diaries, 24, 52, 142, 196
Port Facilities, South Wales, 447
Port, Hamburg, Development, 805
Ports, Great Western Railway, 11
Ports, Humber, 111
Potable Water, Microscopy of, by G. C. Whipple, 780
Power Transmission, Electric, Overhead, by W. T. Taylor, 344
Power-Transmission Lines, Safety Rules, United States Bureau of Standards, 456
Power Plants, Motive-Power Engineering, by H. C. Harris, 361
Press Guide, Auctioneers', 142
Probability and Entropy, Lectures at the University of Leiden, by Prof. H. A. Lorentz, 813
Public Works Annual and Directory of Contractors, 368
Pyrometry, by W. P. Wood and Dr. J. M. Cork, 472

QUANTA, Theory of, Lectures delivered at the University of Leiden, by Prof. H. A. Lorentz, 813

RADIATION, Theory of, Lectures at the University of Leiden, by Prof. H. A. Lorentz, 813
Rainfall, British, 1926, 548
Railway, Great Western, Ports, 11
Railway Guide, Bradshaw's, 618
Railway, London, Midland & Scottish, Railhead Storage and Distribution, 505
Railway Officials, Universal Directory, 677
Railway, Underground, and Omnibus Guide, London, 813
Railway Year Book, 607
Rating, Basis of, Valuation and Depreciation in, by Dr. C. E. Grunsky, 693
Rectifiers, Electric, and Valves, by Prof. A. Güntherschulze, 472
Rectifiers, Mercury Arc, and their Circuits, Principles of, by D. C. Prince and F. B. Vodges, 173
Refrigeration, Ice and Cold Storage Trades Directory, 52
Register Book, British Corporation, Shipping and Aircraft, 195
Reid's Colliery Guide, 614
Research, Scientific, and Electrical Engineering, Interaction, by Dr. J. A. Fleming, 286
Rivers, Gauging Flow of, by W. A. Liddell, 564
Rossendale Anticline, Geology of, 456
Ryland's Directory, Coal, Iron and Allied Trades, 142

SAFETY Rules, Electrical Supply and Communication Lines, United States Bureau of Standards, 456
Schnitte und Stanzen, by E. Göhre, 194
Science, the Great Physicists, by Dr. F. B. Hart, 666
Science Teaching in England, History of, by Miss D. M. Turner, 361
Scientific and Learned Societies', Year Book, 368
Scientific Research and Electrical Engineering Practice, Interaction of, by Dr. J. A. Fleming, 286
Seaton and Rounthwaite's Pocket Book of Marine-Engineering Rules and Tables, 11
Sell's Telegraphic Addresses, 714
Sewage Disposal, by T. H. P. Veal, 456
Sewage Disposal, Activated-Sludge Process, by A. J. Martin, 603
Shafts, Vertical, Sinking, by E. O. F. Brown, 528
Ships, American Types, by A. C. Hardy, 162
Ships, Merchant, Design and Cost of, by A. Kari, 34
Ship Propulsion by Steam, History of, by G. G. Jackson, 193
Ship under Steam, by G. G. Jackson, 193
Shipbuilders, Shipowners and Marine Engineers, Directory of, 196
Shipbuilding, American Ship Types, by A. C. Hardy, 162
Shipbuilding, Design and Cost Estimating, by A. Kari, 34
Shipbuilding, Designs of Small Oil-Engined Vessels, by W. Pollock, 173
Shipowners, Shipbuilders and Marine Engineers, Directory of, 196
Shippers, Merchants and Manufacturers of the World, Kelly's Directory, 813
Shipping, British Corporation Register Book, 195
Sludge, Activated, Sewage Disposal, by A. G. Martin, 603
Societies, Scientific and Learned, Year Book, 368
South and East African Year Book, 74
South Wales, Port Facilities, 447
Southampton Docks, 268
Spanish Mining and Industrial Year Book, 73
Specifications, Standard, Index, 429
Spectroscopy, by Prof. E. C. C. Baly, 371
Speisewasservorwärmung mittels Kesselabgasen, by C. Ruhl, 472
Stamping and Cutting, by E. Göhre, 194
Standard Construction Methods, by G. Underwood, 780
Standard Specifications, Index, 429
Steam Engines. See *Engines*
Steam for Ship Propulsion, History of, by G. G. Jackson, 193
Steam Turbines. See *Turbines*
Steamers, Merchant, Design and Cost of, by A. Kari, 34
Steel Hardening, Instruction, by Schiefer and Grün, 666
Steel and its Heat Treatment, by D. K. Bullens, 517
Steelwork, Constructional, Simply Explained by Dr. O. Faber, 548
Steelwork, Structural, Handbook, 714
Stranded-Copper Conductors, B. I. Tables, 148
Stratified Minerals, Working of, by H. F. Bulman, 346
Streams, Gauging Flow of, by W. A. Liddell, 564
Strength of Materials, by Dr. F. V. Warnock, 471
Strength of Materials, Examples in, by G. W. Bird, 548
Structural Design, Problems in, by Prof. Bishop, 456
Structural Steelwork, Handbook, 714
Surveying, Aerial, Photographic, Flying for, by F. Tymms and Flight-Lieut. C. Porri, 141
Surveying from Air Photographs, Simple Methods, by Lieut. M. Hotine, 194
Supervision and Foremanship, by F. Cushman, 666
Swansea Exchange, Annual Report, 494

TABLES of Electricity Undertakings, Electrician Annual, 666
Tar, Coal, Higher Hydrocarbons, by Dr. A. E. Everest, 372
Teaching Science in England, History of, by Miss D. M. Turner, 361
Telegraphic Addresses, Sell's, 714
Telephone Transmission, Elements of, by H. H. Harrison, 456
Telephony, Wireless, B.B.C. Handbook, 24
Temperature Measurement, by W. P. Wood and Dr. J. M. Cork, 472
Testing Materials, American Society for, Proceedings at French Lick Meeting, 530
Testing, Strength of Materials, by Dr. F. V. Warnock, 471
Therm onic Valves and Rectifiers, by Prof. A. Güntherschulze, 472
Thermodynamics, Applied, by W. Robinson, 780
Thermodynamics Applied to Engineering, by A. F. Macconochie, 529
Thermodynamics, Lectures at the University of Leiden, by Prof. H. A. Lorentz, 813
Timken Engineering Journal, 746
Trades Directory, British and Dominions, 724
Trade Unions and the Law, by A. Henderson, 564
Transformers, Electric, Principles of Design, by W. J. Slichter, 141
Turbines, Steam, Component Parts, by Dr. G. Karass, 666
Turbines, Steam, Materials and Design, by O. Lasche. Translated by Dr. A. L. Mellanby and W. R. Cooper, 33
Turbines à Vapeur, by Prof. G. Belluzzo, 666
Turbo-Generator Plant, Materials and Design in, by O. Lasche, Translated by Dr. A. L. Mellanby and W. R. Cooper, 33

UNDERGROUND Railway and Omnibus Guide, London, 813
United States Bureau of Standards, Safety Rules for Electrical Supply and Communication Lines, 456
United States Ship Types, by A. C. Hardy, 162
Universal Directory, Railway Officials, 677
University of Leiden, Lectures on Theoretical Physics, by Prof. H. A. Lorentz, 813

VALUATION, Depreciation and the Rate-Base, by Dr. C. E. Grunsky, 693
Valves, Thermionic, and Rectifiers, by Prof. A. Güntherschulze, 472
Vertical Shaft Sinking, by E. O. F. Brown, 528
Vibrations, Mechanical, by Dr. J. Geiger, 34

WAGES, British Engineering, by R. S. Spicer, 563
Wages, Modern, by F. Bayle, 346
Warfare, Naval, Aircraft in, by E. F. Spanner, 692. See LETTER, 771
Warships, Italian Navy in the World War, 83
Wassersperrarbeiten bei Bohrungen auf Erdöl, by B. Schweiger, 162
Waste Gases from Boilers, Feed-Water Heating by, by C. Ruhl, 472
Water, Drinking, Microscopy of, by G. C. Whipple, 780
Watt, James, and the Steam Engine, by H. W. Dickinson and R. Jenkins, 82
West Indies, British, Year Book, 1928, 558
Who's Who, 52
Winding Engines, Electrical, Design, Construction and Operation, by H. H. Broughton, 694
Wireless Telephony, B.B.C. Handbook, 24
Wonder Book of Engineering Wonders, Edited by H. Golding, 163
Works Management, Foremanship and Supervision, by F. Cushman, 666
World of Machines, by P. M. Baker, 10

YEAR Book, Austrian Mining Industry, 1927, 74
Year Book, British West Indies, 1928, 558
Year Book, Colliery, 1928, 368
Year Book, Concrete, 196
Year Book, Mining and Industrial, Spanish, 73
Year Book, Railway, 607
Year Book, Scientific and Learned Societies, 368
Year Book, South and East African, 74
Year Books and Annuals, 24, 52, 73, 142, 195

PATENT RECORD.

The Patent Index is classified under the following sub-titles:—AERONAUTICS; ELECTRICAL APPARATUS; GAS ENGINES, PRODUCERS, HOLDERS, &c.; HYDRAULIC MACHINERY; LIFTING AND HAULING APPLIANCES; MACHINE AND OTHER TOOLS, SHAFTING, &c.; MINING, METALLURGY AND METAL WORKING; MISCELLANEOUS; MOTOR ROAD VEHICLES; PUMPS, RAILWAYS AND TRAMWAYS; STEAM ENGINES, BOILERS, EVAPORATORS, &c.; AND TEXTILE MACHINERY.

SUBJECT MATTER.

Aeronautics :

Landing Gear, Amphibious, for Aircraft. A. E. and H. O. Short, 686

Electrical Apparatus :

Aerials, Frame. N. M. Rust and F. P. Swann, 822
Compressors, Rotary. W. Reavell, 822
Cord Grips. G. C. and P. A. Lundberg and G. Pegg, 152
Motor Starter, Alternating-Curent. H. V. James and A. H. Stevens, 686
Switches, Electric. Whipp & Bourne, Ltd., and F. Whipp, 686

Gas Engines, Producers, Holders, &c. :

Carburettors. G. F. Hunter, 90
Coke-Conveying and Quenching Apparatus. South Metropolitan Gas Co. and C. H. Smith, 686
Internal-Combustion Engines. Coventry-Climax Engines, Ltd., and J. T. Wooddisse, 822
Internal-Combustion Engines. Douglas Motors, Ltd. and C. G. Pullin, 90
Internal-Combustion Engines. A. G. Pitt, A. C. Stevenson and W. H. Crozier, 624
Pistons. Midland Motor Cylinder Co., Ltd., and P. Pritchard, 152
Retort Settings. H. J. Toogood and R. Dempster & Sons, Ltd., 60
Sparking Plugs. H. L. Barraclough, 60
Valve Spring Lifter. A. V. Terry, 90

Hydraulic Machinery :

Hydraulic Motor Control. Brown Brothers & Co., Ltd., and W. Wallace, 822

Lifting and Hauling Appliances :

Conveying Apparatus. Ransomes & Rapier, Ltd., and W. J. Bowtell, 496

Machine and other Tools, Shafting, &c. :

Bearings, Shaft. British Thomson-Houston Co., Ltd., and C. J. Morton, 822
Couplings, Shaft. F. C. Russell and J. H. Bradbury, 152

Mining, Metallurgy and Metal Working :

Coal-Breaking Machines. B. Norton, 152
Coal, Pneumatic Conveyance of. Dorman, Long & Co., Ltd., and M. R. Kirby, 686
Compressed-Air Engines. J. S. & W. E. Highfield, 624
Drills, Rock. A. T. and P. M. Holman, 496
Furnaces. L. Morton and J. Hargrove, 152
Hearths, Rotary, for Furnaces. C. Nelson and King, Taudevin & Gregson, Ltd., 624
Moulding Boxes, Filling. Cammell Laird & Co., Ltd., J. McN. and J. V. Allan, and H. C. Loving, 686
Pickling Tubes, Apparatus for. Wellman Seaver Rolling Mill Co., Ltd., and S. Smith, 496

Miscellaneous :

Concrete Block Making Machines. R. Hickton and W. W. Bagguley, 60
Discharging Grain from Ships. Henry Simon, Ltd., and H. Williams, 90
Filters. Shell-Mex, Ltd., and J. Lawson, 496
Trench-Cutting Machines. E. Watson, 90
Pipe Joints. John Spencer, Ltd., and Sir T. H. Spencer, 822
Presses. Thos. C. Fawcett, Ltd., D. L. Fawcett and W. Clough, 244

Motor Road Vehicles :

Brake Mechanism, Fluid Pressure. D. H. Cross, 152
Mountings, Engine and Gear-Box. Riley (Coventry), Ltd., & H. Rush, 624
Tip-Wagon Road Vehicles. Willys Overland Crossley, Ltd., and F. Mallett, 90
Vehicles, Motor Road. John I. Thornycroft & Co., Ltd., and T. Thornycroft, 244
Wheels, Sprocket. Roadless Traction, Ltd., and E. L. Firth, 496

Pumps :

Reciprocating Pumps. J. Sadler and Atkinson Walker Wagons, Ltd., 244

Railways and Tramways :

Blast Pipes, Locomotive. H. A. Stenning, 90
Bogies, Radial, Two-Wheeled. H. Edington, 152
Bow Collectors. Brecknell, Munro & Rogers, Ltd., and A. M. Willis, 624
Locomotives, Articulated. North British Locomotive Co., Ltd., and J. Black, 496
Locomotives. Leeds Forge Co., Ltd., and S. E. Alley, 244
Wagon Tipplers, Rotary. Babcock & Wilcox, Ltd., and R. B. Wright, 624

Steam Engines, Boilers, Evaporators, &c :

Boilers, Multi-Tubular. Shelton Iron, Steel & Coal Co., Ltd., and C. B. Gardner, 60
Boilers, Steam. Galloways, Ltd., and H. Pilling, 244
Boilers, Water-Tube. P. F. Crinks and Vickers Boiler Co., Ltd., 244
Engines, Reciprocating. A. T. and K. J. Holman, 496
Engines, Steam, Single-Acting. S. E. Alley, 60
Governors, Constant-Pressure. Daniel Adamson & Co., Ltd., and J. Gilmour, 90
Packing, Metallic. British Metallic Packing Co., Ltd., and G. F. Jones, 60
Superheaters, Steam. C. H. Fowler and John Fowler & Co. (Leeds), Ltd., 496
Valves, Slide. Alex. Turnbull & Co., Ltd., W. H. Howden and L. F. Norrie, 244

Textile Machinery :

Spinning Frames, Ring. Cook & Co. (Manchester), Ltd., V. Ayres, and J. F. Taylor, 60

NAMES OF PATENTEES.

Adamson, Daniel, & Co., Ltd., and another. Constant-Pressure Governors, 90
Allan, J. McN. and J. V., and others. Filling Moulding Boxes, 686
Alley, S. E. Single-Acting Steam Engines, 60
Alley, S. E., and others. Locomotives, 244
Atkinson Walker Wagons, Ltd., and another. Reciprocating Pumps, 244
Ayres, V., and others. Ring Spinning Frames, 60

Babcock & Wilcox, Ltd., and another. Rotary Wagon Tipplers, 624
Bagguley, W. W., and another. Concrete Block Making Machines, 60
Barraclough, H. L. Sparking Plugs, 60
Black, J., and others. Articulated Locomotives, 496
Bowtell, W. J., and others. Conveying Apparatus, 496
Bradbury, J. H., and another. Shaft Couplings, 152
Brecknell, Munro & Rogers, Ltd., and another. Bow Collectors, 624
British Metallic Packing Co., Ltd., and another. Metallic Packing, 60
British Thomson-Houston Co., Ltd., and another. Shaft Bearings, 822
Brown Brothers & Co., Ltd., and another, Hydraulic Motor Control, 822

Cammell, Laird, & Co., Ltd., and others. Filling Moulding Boxes, 686
Clough, W., and others. Presses, 244
Cook & Co. (Manchester), Ltd., and others. Ring Spinning Frames, 60
Coventry Climax Engines, Ltd., and another. Internal-Combustion Engines, 822
Crinks, P. F., and others. Water-Tube Boilers, 244
Cross, D. H. Fluid-Pressure Brake Mechanism, 152
Crozier, W. H., and others. Internal-Combustion Engines, 624

Dempster, Robert, & Sons, Ltd., and another. Retort Settings, 60
Dorman, Long, & Co., Ltd., and another. Pneumatic Conveyance of Coal, 686
Douglas Motors, Ltd., and another. Internal-Combustion Engines, 90

Edington, H. Two-Wheeled Radial Bogies, 152

Fawcett, D. L., and others. Presses, 244
Fawcett, Thos. C., Ltd., and others. Presses, 244
Firth, E. L., and others. Sprocket Wheels, 496
Fowler, C. H., and others. Steam Superheaters, 496
Fowler, John, & Co. (Leeds), Ltd., and another. Steam Superheaters, 496

Galloways, Ltd., and another. Steam Boilers, 244
Gardner, C. B., and others. Multi-tubular Boilers, 60
Gilmour, J., and others. Constant-Pressure Governors, 90

Hargrove, J., and another. Furnaces, 152
Hickton, R., and another. Concrete Block-making Machines, 60
Highfield, J. S. and W. E. Compressed-Air Engines, 624
Holman, A. T. and K. J. Reciprocating Engines, 496
Holman, A. T. and P. M. Rock Drills, 496
Howden, W. H., and others. Slide Valves, 244
Hunter, G. F. Carburettors, 90

James, H. V., and another. Alternating-Current Motor Starter, 686
Jones, G. F., and others. Metallic Packing, 60

King, Taudevin & Gregson, Ltd., and another. Rotary Hearths for Furnaces, 624
Kirby, M. R., and others. Pneumatic Conveyance of Coal, 686

Lawson, J., and others. Filters, 496
Leeds Forge Co., Ltd., and another. Locomotives, 244
Loving, H. C., and others. Filling Moulding Boxes, 686
Lundberg, G. C. and P. A., and another. Cord Grips, 152

Mallett, F., and others. Tip-Wagon Road Vehicles, 90
Midland Motor Cylinder Co., Ltd., and another. Pistons, 152
Morton, C. J., and others. Shaft Bearings, 822
Morton, L., and another. Furnaces, 152

Nelson, C., and others. Rotary Hearths for Furnaces, 624
Norrie, L. F., and others. Slide Valves, 244
North British Locomotive Co., Ltd., and another. Articulated Locomotives, 496
Norton, B. Machines for Breaking Coal, 152

Pegg, G., and others. Cord Grips, 152
Pilling, H., and others. Steam Boilers, 244
Pitt, A. G., and others. Internal-Combustion Engines, 624.
Pritchard, P., and others. Pistons, 152
Pullin, C. G., and others. Internal-Combustion Engines, 90.

Ransomes & Rapier, Ltd., and another. Conveying apparatus, 496
Reavell, W. Rotary Compressors, 822
Riley (Coventry), Ltd., and another. Engine and Gear-Box Mountings, 624
Roadless Traction, Ltd., and another. Sprocket Wheels, 496
Rush, H., and others. Engine and Gear-Box Mountings, 624
Russell, F. C., and another. Shaft Couplings, 152
Rust, N. M., and another. Frame Aerials, 822

Sadler, J., and others. Reciprocating Pumps, 244
Shell-Mex, Ltd., and another. Filters, 496
Shelton Iron, Steel & Coal Co., Ltd., and another. Multi-Tubular Boilers, 60
Short, A. E. and H. O. Amphibious Landing Gear for Aircraft, 686
Simon, Henry, Ltd., and another. Discharging Grain from Ships, 90
Smith, C. H., and others. Coke-Conveying and Quenching Apparatus, 686
Smith, S., and others. Apparatus for Pickling Tubes, 496
South Metropolitan Gas Co. and another. Coke-Conveying and Quenching Apparatus, 686
Spencer, John, Ltd., and another. Pipe Joints, 822
Spencer, Sir T. H., and others. Pipe Joints, 822
Stenning, H. A. Locomotive Blast Pipes, 90
Stevens, A. H., and another. Alternating-Current Motor Starter, 686
Stevenson, A. C., and others. Internal-Combustion Engines, 624
Swann, F. P., and another. Frame Aerials, 822

Taylor, J. F., and others. Ring Spinning Frames, 60
Terry, A. V. Valve-Spring Lifter, 90
Thornycroft, J. I., & Co., Ltd., and another. Motor Road Vehicles, 244
Thornycroft, T., and others. Motor Road Vehicles, 244
Toogood, H. J., and others. Retort Settings, 60
Turnbull, Alex., & Co., Ltd., and others. Slide Valves, 244

Vickers Boiler Company, Ltd., and another. Water-Tube Boilers, 244

Wallace, W., and others. Hydraulic Motor Control, 822
Watson, E. Trench-Cutting Machines, 90
Wellman Seaver Rolling Mill Co., Ltd., and another. Apparatus for Pickling Tubes, 496
Whipp & Bourne, Ltd., and another. Electric Switches, 686
Whipp, F., and others. Electric Switches, 686
Williams, H., and others. Discharging Grain from Ships, 90
Willis, A. M., and others. Bow Collectors, 624
Willys Overland Crossley, Ltd., and another. Tip-Wagon Road Vehicles, 90
Wooddisse, J. T., and others. Internal-Combustion Engines, 822
Wright, R. B., and others. Rotary Wagon Tipplers, 624

PARAGRAPHS.

Accidents :

Albemarle Street Explosion, 45
Posters, Safety, 360

Aeronautics :

Altitude Record, Aeroplanes, 179
Aviation, Value to British Empire, 573
British Corporation Rules and Tables, 738
Canada, Aerial Surveying in, 536
Cirrus Aero Engine, 120, 174
Exhibition, International Aeronautical, 805
Roe, A. V., Banquet to, 639

Agriculture :

Canadian Machinery Production, 329
Manchurian Statistics, 360
Royal Show, 232
Russia, Use of Electricity for Agriculture, 607
Seville, Reclamation of Land, Proposed, 479

Alloys. See *Mining and Metallurgy*

Appointments, Awards, &c. :

Cardiff Chamber of Commerce, Officers, 383
Cardiff, &c., Pitwood Importers Association, Chairman, 383
Coopers' Hill War Memorial Prize, 352
Faraday Medal, to Professor J. A. Fleming, 111

Automobiles. See *Motor Cars*

Boilers. See *Engines and Boilers*

Bridges :

Bridge and Structural Engineering Conference, 804
Montrose Reinforced Concrete Bridge, 383
St. Lawrence, Proposed Bridge, 518
Secondary Stresses, *Erratum*, 290
Sydney Harbour Bridge, *Erratum*, 540

Buildings and Building Construction :

Hygiene in Building, 320
Steel, Structural (Catalogue), 588

Canals :

Gaillard Memorial Tablet, Panama, 383
Manchester Ship Statistics, 429
Panama Traffic, 276, 388, 443
Tank Ship Traffic, Panama, 443
Wheat Traffic, Panama, 388

Catalogues :

30, 119, 182, 306, 368, 399, 464, 588, 623, 654, 756
A.C.E.C. Company, 623
A.E.G. Machinery & Apparatus Co., Ltd., 30, 306
Acheson, E. G., Ltd., 119
Allen, W. G., & Sons (Tipton), Ltd., 756
Autogenwerk Sirius Co., 119
Bean Cars, Ltd., 623
Berliner Maschinenbau A.-G., 306
Birmingham Electric Furnaces, Ltd., 756
Birmingham Small Arms Co., 399
Bithell, W. J., Ltd., 399
Blackman Export Co., Ltd., 119, 399
Blackstone & Co., Ltd., 30
Braby, Fredk., & Co., Ltd., 588
British Aluminium Co., Ltd., 119, 588
British Brown-Boveri, Ltd., 654
British Insulated Cables, Ltd., 119, 368, 464, 756
British Oxygen Co., Ltd., 399
British Rema Manufacturing Co., Ltd., 654
British Secheron Co., Ltd., 306
British Steam Specialties, Ltd., 30
British Thomson-Houston Co., Ltd., 119, 182
Brook Motors, Ltd., 588
Brookhirst Switchgear, Ltd., 588
Buckton, Joshua, & Co., Ltd., 306, 368
Budenberg Gauge Co., Ltd., 588, 654
Cambrian Wagon Co., Ltd., 182
Cantie Switches, Ltd., 756
Caterpillar Tractor Co., 306
Celite Products Corporation, 182
Consolidated Pneumatic Tool Co., Ltd., 182
Cressall Manufacturing Co., 588
Crofts (Engineers), Ltd., 623
Crompton, Parkinson, Ltd., 756
Davenport Engineering Co., Ltd., 588
Davey, Paxman, & Co., Ltd., 30
Demag Co., 623
Dieny, Paul, 306
Dikkers, G., & Co. (England), Ltd., 399
Dowdings' Machine Tool Co., Ltd., 654
Dowson & Mason Gas Plant Co., Ltd., 756
Electrical Equipment & Carbon Co., Ltd., 368
English Electric Co., Ltd., 30, 464, 623
Escher, Wyss & Co., 623
Farrar Boiler Works, Ltd., 464
Findlay & Co., 588
Fletcher, George, & Co., Ltd., 588
Flexible Drive & Tool Company, 654
Foster-Wheeler Corporation, 399
Geipel, William, Ltd., 182
General Chemical & Pharmaceutical Co., Ltd., 756
General Electric Co., Ltd., 306
Gilman, F., Ltd., 588
Glacier Co., Ltd., 654
Gledhill Brook Time Recorders, 464
Griffin, John G., & Sons, Ltd., 588

Catalogues—*continued.*

Hadfields, Ltd., 182
Haggerty, Lawrence & Co., 756
Ham, Baker & Co., Ltd., 306
Higgins, Chas. M., & Co., 588
Hoffman Manufacturing Co., Ltd., 30
Humpleby & Co., 399
Jackman, J. W., & Co., Ltd., 306
Johnson, Rd., Clapham & Morris, Ltd., 588
Langley, London, Ltd., 119
Lunken Co., Ltd., 399
Marconi's Wireless Telegraph Co., Ltd., 756
Marryat & Scott, Ltd., 30
Marshall, Sons & Co., Ltd., 182, 306, 368, 588
Mavor & Coulson, Ltd., 399, 623
Merryweather & Sons, Ltd., 464
Mirrlees-Watson Co., Ltd., 30
Moreland, Hayne & Co., Ltd., 368
Morris, Herbert, Ltd., 30, 588
Moss Gear Co., Ltd., 756
Neal, R. H., & Co., 756
Newton, Chambers & Co., Ltd., 623
Oerlikon Co., Ltd., 306, 464, 623
Osborne, Samuel, & Co., Ltd., 464
Pels, Henry, 588
Peters, G. D., & Co., Ltd., 399
Petters, Ltd., 119
Pidgen Brothers, 623
Power Specialty Co., Ltd., 399
Ransomes & Rapier, Ltd., 654
Rateau Company, 623
Reavell & Co., Ltd., 368
Relay Automatic Telephone Co., Ltd., 30
Ruston & Hornsby, Ltd., 756
Ruth's Steam Accumulators, Ltd., 464
Sankey, J. H., & Son, Ltd., 654
Scott Brothers (Keighley), 119
Sentinel Waggon Works, Ltd., 119
Siemens Brothers & Co., Ltd., 654
Simon, Henry, Ltd., 119
Skelton, R. A., & Co., Steel & Engineering, Ltd., 464
Smit, W., & Co., Ltd., 399
Soag Machine Tools, Ltd., 654
Societa Nazionale delle Officine di Savigliano, 588
Standard Telephones & Cables, Ltd., 368
Stewart, Duncan, & Co., Ltd., 306
Stewarts & Lloyds, Ltd., 588
Stirk, John, & Sons, Ltd., 588
Stothert & Pitt, Ltd., 182, 368
Suffolk Iron Foundry (1920), Ltd., 182
Sulzer Brothers, 588, 654
Superheater Co., Ltd., 588
Tangyes, Ltd., 623
Thermoconcrete Constructions, 399
Tungstone Accumulator Co., Ltd., 588
Universal Ball-Bearing Repair & Manufacturing Co., 399
Universal System of Machine Moulding & Machinery Co., Ltd., 368
Verdon, Cutts & Co., Ltd., 30
Verkstadsaktiebolaget, 399
Wagner Electric Corporation, 588
Watts, Fincham & Co., Ltd., 654
Wentworth, Darcy, 588
West, Allen, & Co., Ltd., 756
Westinghouse Brake & Saxby Signal Co., Ltd., 588, 654, 756
Westinghouse Electric & Manufacturing Co., 368
Wheels, H. M. C., Ltd., 182
Wightman, Mountain & Andrews, Ltd., 306
Wiley, James, & Sons, Ltd., 464
Wilson, David, & Co., 756
Wolf, S., & Co., Ltd., 588

Cement and Concrete :

Fire Cement "Pyruma" (Catalogue), 654
Mixing Machines (Catalogue), 654
Moulds, Concrete (Catalogue), 399
Water Conduits, Concrete, 202

Chemistry. See *Physics and Chemistry*

Coal :

Air Compressors for Mines (Catalogue), 368
Bituminous Coal, Conference, 4, 821
Carbonisation Conference, 75
Cardiff, 15, 45, 75, 105, 134, 166, 197, 235, 258, 291, 321, 353, 383, 415, 446, 478, 510, 541, 573, 607, 639, 669, 705, 739, 772, 805
Colliery Deals, 258, 353, 573, 639
Colliery Guide, Reid's, 614
Colliery Losses, 705
Colliery Materials, Standard, 579
Colliery Year Book, 368
Exports, British, Trade Returns, 813
Indiana Fuel Conference, 194
Iron and Coal Trades Review, Jubilee, Number, 105
Machinery, Coal-Mining (Catalogue), 623
Middlesbrough Coke, 14, 44, 75, 105, 135, 166, 196, 235, 258, 290, 320, 353, 382, 414, 446, 479, 511, 540, 572, 606, 638, 668, 705, 739, 772, 804
Pit Props, Tubular (Catalogue), 588
Pit Timber Transfer and Railway Charge, 105
Sheffield, 14, 44, 74, 105, 135, 166, 196, 235, 258, 291, 321, 353, 382, 414, 447, 479, 510, 541, 573, 607, 639, 669, 705, 739, 772, 805
South Wales Trade Losses, 291
Tippers, South Wales, and Waiting Time Payments, 197
Trimmers' Night Work, Abolition Question, 134

Coal—*continued.*

Tub Greasers, Automatic, 28
Welsh Owners Marketing Scheme, 15, 235, 669

Colleges. See *Education*

Companies :

Albion Steam Coal Co., Ltd., 446
Company Registration, 1927, 235
Powell Duffryn Steam Coal Co., Ltd., 258, 353
Welsh Anthracite Collieries, Ltd., 669

Concrete. See *Cement and Concrete*

Cranes, Conveyors, &c. :

Cranes (Catalogues), 588, 623
Cranes, Hand (Catalogue), 588
Floating Crane, 125-ton, South Wales Ports, 614
Lifts (Catalogue), 30 (2)

Docks. See *Harbours, &c.*

Education :

Atmospherics, East London College Lectures, 174
Canada, Western, New Technical School, 135
Crystal Palace School of Engineering, 52
Electrical Engineering Scholarships, Faraday, 443
Highway Engineering, Chair of, London University, 813
Skilled Employment and Apprenticeship Association, 711
London University College Dinner, 206
London University College Public Lectures, 507, 573
London University College, Report, 607
Whitworth Scholarship Awards, 24

Electricity :

Accumulators, House Lighting (Catalogue), 588
Alluvial Mining, Electric Drive in, 32
Atkinson, Lt. B., Portrait Presentation to Electrical Engineers, 174
Atmospherics, East London College Lectures, 174
British Columbia Water Power Plant, 744
Canadian Hydro-Electric Installations, 268
Central England Electricity Scheme, 756
Clacton-on-Sea, Vicinity Supply, 502
Conductors, Copper, Stranded, B.I. Tables, 148
Converters, Rotary, Electrical Performance, Standard, 235
Converter, Rotary, Substation Equipment (Catalogue), 756
Doncaster, Generating Plant Extensions, 511
Electrodes, Furnace (Catalogue), 368
Equipment (Catalogue), 119
Faraday's Notebooks, Ice and Regulation, 235
Fittings, Electric, Statutory Committee, 257
Furnaces, Arc, Steel, Energy Losses, 150
Furnaces, Electric (Catalogues), 588, 756
Fuse Wires (Catalogue), 368
Generating Plant, Small (Catalogue), 119
Generators, Electric (Catalogues), 306, 622 (2)
"George Montefiore" Prize, 669
Heating Elements, Electric (Catalogue), 588
Insulators (Catalogue), 119
Jersey Power Contract, 352
Lamps, Electric (Catalogue), 306
Machinery, General (Catalogues), 30, 306, 368, 588, 623, 654
Manchuria, Wireless Telegraphy in, 162
Midlands, North West, Electricity Scheme, 794
Motor-Converters (Catalogue), 182
Motors, General (Catalogue), 30, 588 (2)
Motors and Regulators, Induction (Catalogue), 464
Motor Starters and Control Gear (Catalogue), 756
Mukden, Automatic Telephones in, 383
Oil Reservoirs, Lightning Protection, 360
Ontario Water Power Contract, 281
Overhead Lines, Aluminium (Catalogue), 119
Plugs and Sockets, Standard, 59, 257
Railways, Early Use of Electricity, 45
Railways, Electrical, Standardisation of Equipment, 52
Rheostats, Field, Standard, 306
St. Pancras Generating Station, Extensions, 22
Scholarships, Electrical Engineering, 443
Shanghai, Electricity Supply in, 805
Supplies, Electric (Catalogue), 464
Switchboards, Power, Standard, 494
Switches and Fuses (Catalogues), 390, 756 (2)
Tools, Electric (Catalogue), 588
Telephones (Catalogue), 30
Tramway Poles, Tubular, Standard, 228
Transmission Lines, Aluminium (Catalogue), 588
Transmission Lines, Fittings (Catalogues), 654
Turbo-Generators (Catalogue), 464
Typewriting Telegraphy (Catalogue), 368
Voltage Control (Catalogue), 588

Electricity—*continued.*

Water Power of the World, 206
Welding (Catalogues), 30, 756
Wireless Telegraphic Apparatus (Catalogue), 756
Wireless Telegraphy in Ships' Lifeboats, 424
Wiring, Surface (Catalogue), 182

Engines and Boilers :

Accumulators, Steam (Catalogue), 464
Bauer-Wach Exhaust Turbine, 206
Boilers (Catalogue), 464
Boiler Control, Hagan Automatic, 382
Boiler Plant, High-Pressure, for Billingham, 226
Condensers (Catalogues), 30
Engines, Marine (Catalogues), 399, 588
Engines, Portable, &c. (Catalogue), 306
Engines, Steam (Catalogue), 588
Fittings, Steam (Catalogue), 30, 399
Gauges, Pressure (Catalogue), 588
Marine Machinery Output, 1927, 75, 105
Pressure Regulators (Catalogue), 756
Pulverised Coal Firing (Catalogue), 654
Steam Plant (Catalogue), 399
Superheating, Locomotive (Catalogue), 588
Turbines, Steam (Catalogue), 623
Valves, &c. (Catalogue), 399
Water-Cooling Towers (Catalogue), 588

Errata and Addenda :

Bari, Port of, 382
Chemical Industry Conference, 665
Cirrus Aero Engine, 174
Civil Engineers, Institution of, Conference, 814
Contract, English Electric Co., 582
Crewe Locomotive Works, 414
Davits, Listproof Boat, 541
"Duchess of Bedford," 711
Engine Knock and Related Problems, 713
English Electric Co., Contract, 582
Flat Plates Fixed at Circumference, Deflection of, 83
Measuring-Tape Tests. U.S. Bureau of Standards, 805
Mechanical Engineers, Institution of, 414
Railway Work, New Materials in, 739
Secondary Stresses, 290
Sydney Harbour Bridge, 540

Exhibitions :

Aeronautical, International, 805
British Industries Fair (1929), 695
Empire Timbers, Imperial Institute, 146
French Industrial Fuel, 383
Health, Plymouth, 9
Machine-Tool Exhibition, 228
Milan, Cycle and Motor-Cycle Show, 144
Motor, Confidential Reports, 606
Motor Show, Buenos Aires, 805
North-East Coast Exhibition, 228.
Paris, Aeronautical Exhibition, 558
Paris, International Nautical, 383
Philadelphia Motor Show, 265
Quarrying Plant, 411
Sheffield, "Quality Before Cheapness," 235
Workmanship Exhibition, Proposed, 773
Zagreb Spring Fair, 821

Explosions. See *Accidents*

Explosives. See *Guns and Explosives*

Ferro-Concrete. See *Cement and Concrete*

Flying Machines. See *Aeronautics*

Gas and Oil Engines :

Engine Knock and Related Problems, *Errata*, 713
Gasholders (Catalogue), 623
Oil Engines, General (Catalogues), 30 (2), 182, 654
Oil Engines, Heavy-Fuel (Catalogue), 30
Oil Engines, Marine (Catalogue), 654

Guns and Explosives :

Carbon Bisulphide, Conveyance by Road, 669

Harbours, Docks and Piers :

Bari Port, *Addendum*, 382
Hamburg, Port of, Development, 805
Humber Ports, Booklet, 111
South Wales Port Facilities, 447
Southampton Docks, Developments and Extension, 268
Welsh Docks Traffic, 45

Hydraulics :

Pumps (Catalogues), 182, 623
Pumps, Merchandise Marks Inquiry, 748
Valves, Penstocks, &c. (Catalogue), 306

Industries and Commerce :

Administration, Industrial, Pitman's Dictionary, 259
Arrowroot Flour in Natal, Machinery Enquiry, 518
Australian Exports and Imports, 685, 817

Industries and Commerce—*continued.*

Belgian Iron and Steel Combine, 212
British and Dominions Trades' Directory, 724
British West Indies Year Book, 558
Canada, Scientific Supplies Requirement, 740
Canadian Newsprint Industry, 361
Cardiff Chamber of Commerce, President, 383
Colombia and its Possibilities, 415
Company Registration, 1927, 235
Contracts, 24, 44, 75, 104, 134, 167, 197, 228, 265, 290, 320, 353, 383, 415, 479, 511, 541, 572, 582 (*Erratum*), 606, 639, 668, 712, 740, 772, 804
Designs, Industrial, Competition, 53, 182
Directory, Foreign Buyers, 550
Export Credits Department, Lancashire Representative, 537
Hollow-Ware Making Trade Board, Scope, 349
Lithuania, Commercial and Economic Conditions, 615
Merchandise Marks, B.O.T., 144, 329, 372, 573, 638, 748, 805
Montreal Grain Shipment, 258
New Zealand Tenders, 336
Ontario, Industrial Research Scheme, 15
Overseas Trade, Foreign Buyers' Directory, 550
Personal, 14, 45, 75, 105, 135, 174, 206, 227, 259, 290, 320, 353, 382, 447, 479, 511, 541, 572, 607, 638, 668, 712, 746, 772, 805
Rubber, Synthetic, 149
Russian-Mongolian Trade Figures, 291
Scotch Contracts, Various, 134
Sheffield "Quality before Cheapness" Exhibition, Proposed, 235, 773
Skilled Employment and Apprenticeship Association, 711
Swansea Exchange, Inc., 494
Tenders, 24, 44, 75, 105, 134, 167, 227, 265, 290, 321, 352, 414, 446, 479, 484, 541, 572, 639, 668, 739, 773, 805
Trade Opportunities, Various, 329, 333, 415, 424, 479, 518, 561, 780
United States Mica Trade, 805
United States Petroleum Refining, 698
Welfare Organisation, Stewart & Lloyds, 121

Institutions. See *Technical Societies*

Iron and Steel :

Bars, Steel, for Machined Parts, Standard, 185
Beams, Rolled Steel (Catalogue), 464
Belgian Combine, 212
Bell, 18-ton Rockfeller Carillon, 321
Bolt Heads, Nuts and Washers, Standard, 308
British Production, 135, 228, 415, 549, 615, 803
Canadian Production, 530
Cast Iron, Corrodibility, 338
Castings, Grey Iron, Standard, 480
Castings, Malleable-Iron, Standard, 276
Castings, Steel (Catalogue), 464
Cleveland, 14, 44, 75, 105, 135, 166, 196, 235, 258, 290, 320, 353, 382, 414, 446, 479, 511, 540, 572, 606, 638, 668, 705, 739, 772, 804
Coke Oven Plant, Consett Iron Co., 165
Constructional Steel (Catalogues), 368, 588
Czechoslovakian Trade, 104
East Coast Hematite, 14, 44, 75, 105, 135, 166, 196, 235, 258, 290, 320, 353, 382, 414, 446, 479, 511, 540, 572, 606, 638, 668, 705, 739, 772, 804
Flat Plates Fixed at Circumference, Deflection of, *Erratum*, 83
French Production, 149
Hadfield's East Hecla Works, 773
Insurance Association, Iron Trades Employers', 669
Iron and Coal Trades Review, Jubilee Issue, 104
Middlesbrough Foreign Ore, 14, 44, 75, 105, 135, 166, 196, 235, 258, 290, 320, 353, 382, 414, 446, 479, 511, 540, 572, 606, 638, 668, 705, 739, 772, 804
Pipe Flanges, Standard, 716
Prices Chart, 360
Rolling of Steel Plates, Record, 104
Scotch Shipments, 15, 45, 74, 104, 134, 167, 197, 235, 259, 291, 320, 352, 383, 415, 447, 478, 511, 541, 573, 607, 639, 669, 705, 739, 773, 805
Scotch Trade, 15, 45, 74, 104, 134, 167, 197, 235, 259, 291, 320, 352, 383, 415, 445, 478, 511, 541, 573, 607, 639, 669, 705, 739, 773, 805
Sheffield, 14, 44, 74, 105, 135, 166, 196, 235, 258, 291, 321, 353, 382, 414, 447, 479, 510, 541, 573, 607, 639, 669, 705, 739, 773, 805
Steel Plate Work (Catalogue), 756
Steels, Special (Catalogue), 182
Structural Steel Work, Handbook, 714
Swedish Industry, 716
Tees Imports, 166, 290, 414, 572, 705
Tees Shipments, 14, 166, 290, 414, 540, 705
United States Ore Production, 13, 84
United States Pig Iron Production, 13
Welsh Ship Plate Contracts, 15
Welsh Trade, 75, 134, 167, 235, 258, 291, 321, 353, 383, 478, 510, 541, 573, 607, 639, 669, 705, 739, 773, 805
Workmanship Exhibition, 773
Works Machinery (Catalogue), 306

Labour Questions. See *Trade Societies*

Lighting. See *Electricity and Gas*

Literature. See LITERATURE INDEX

Locomotives. See *Railways*

Machine and Other Tools :

Centreless Grinding Process (Catalogue), 399
Hack Saw Blade, Eclipse, 639
Knives, Machine (Catalogue), 399

Machine and other Tools—*continued.*

Machine Tools, General (Catalogues), 119, 368, 623, 654
Metals, Non-Ferrous, Prices, 348
Milling Machine, Horizontal, Regulations, 639
Planing Machines (Catalogue), 588
Pneumatic Tools (Catalogue), 182
Punching and Shearing Machine (Catalogue), 588
Reamer Diameters, Tolerances, Standard, 729
Scaling Tools (Catalogue), 588
Trade Opportunities at Bucharest, 780

Marine Engineering. See *Engines and Boilers*; *Ships and Shipbuilding*

Markets :

Cleveland, 14, 44, 75, 105, 135, 166, 196, 235, 258, 290, 320, 353, 382, 414, 446, 479, 511, 540, 572, 606, 638, 668, 705, 739, 772, 804
Welsh Tinplate Trade, 306

Mining and Metallurgy :

Alluvial Mining, Electrive Drive in, 32
Bearing Metals (Catalogue), 654
Coke Oven Plant, Consett Iron Co., 165
East Africa, Tanganyika Concessions Prospecting Licence, 760
Foundry Machines (Catalogue), 368
Metal Cleaning (Catalogue), 306
Metals (Catalogue), 588
Ontario Gold Output, 621
Petroleum Production, 459
Smiths' Hearths and Forges (Catalogue), 119
Tin Production, British Empire, 186

Miscellaneous :

Auctioneers' Press Guide, 142
Austria, Road Construction in, 766
Balances, Spring, B.O.T. Marking, 573
Bell, Rockfeller Carillon, 18-ton, 321
Blow Pipe, Welding (Catalogue), 119
Bolts and Nuts (Catalogue), 464
Books, Mechanical Engineering, Catalogue of, 400
British Columbia, Land Reclamation in, 773
British West Indies Year Book, 558
Chemical Engineering and Chemical Catalogue, 555
Chile Public Works, 615
Chilean Government Developments, 383
Cold Storage Plant, B.C., 377
Compressors Air (Catalogue), 368
Contractors, Directory of, and Public Works Annual, 368
Contracts, 24, 44, 75, 104, 134, 167, 197, 228, 265, 290, 320, 353, 383, 415, 479, 511, 541, 572, 582 (*Erratum*), 606, 639, 668, 712, 740, 772, 804
Cubic Reckoner, Swift 773
Dictionary, Pitman's of Industrial Administration, 259
Drawing Office Practice, Standard, 146
Dryers, Hot-Air (Catalogue), 399
Elevator, Grain, Million-Bushel, 321
Engineering Standards Association, British, 59, 146, 185, 228, 235, 257, 276, 306, 308, 340, 400, 429, 480, 494, 579, 623, 666, 715, 729, 756, 803, 813
Engineers' Stores (Catalogue), 654
Fans (Catalogue), 399
Fans, Turbo (Catalogue), 623
Fire Extinguishing Plant, Oil and Petrol (Catalogue), 464
Fire Hose Couplings, Standard, 813
Fuel Oil, United States Consumption, 240
Gauges, Broken Stone and Chippings, Standard, 666
Glassware Illumination Fittings, Standard, 400
Grain-Loading Plant (Catalogue), 119
Grain Traffic, Canadian, 125
Heating, Central (Catalogue), 588
Illumination, International Commission, 480
Inks, Drawing (Catalogue), 588
Insulators, Heat (Catalogue), 182
Linthicum Prize Essay on Scientific Property, 29
Logarithmic Tables, 682
Lubricator, Forced Feed (Catalogue), 306
Lubricants, Graphite (Catalogue), 119
Mathematical Tables, 682
Measuring Tape Tests, U.S. Bureau of Standards, *Errata*, 805
Montreal Grain Shipment, 258
Oil and Petrol Measures (Catalogue), 756
Oil Reservoirs, Lighting Protection, 360
Paints, Varnishes, &c., Standard, 756, 803
Paper Makers, Directory of, 479
Pattern Plates, Artificial-Stone, 616
Paving (Catalogue), 119
Pernambuco Road Construction Fund, 424
Personal, 14, 45, 75, 105, 135, 174, 206, 227, 259, 290, 320, 353, 382, 447, 479, 511, 541, 572, 607, 638, 668, 712, 746, 772, 805
Petrol Pumps, Verification, &c., 526
Pipe Flanges, Standard, 715
Poland, Road Construction in, 539
Pulp and Paper Mill, New Brunswick, 329
Pumps, Various Fluids (Catalogue), 182
Quarry Machinery (Catalogue), 368
Refrigerator, British Electrical, Campaign, 590
Revolution Counters (Catalogue), 588
Road Construction in Austria, 766
Road-making Machinery (Catalogue), 368
Road-making Machinery, Trade Opportunities in Colombia, 329
Scientific and Learned Societies, Year Book, 368
Scientific Property Essay, Linthicum Prize, 29
Scotch Contracts, Various, 134
Sells' Telegraphic Addresses, 714
Shovels, Mechanical (Catalogues), 756 (2)
Squared Paper (Catalogue), 306
Standards, British, Index to Specifications, 429

Miscellaneous—*continued.*

Tachometers (Catalogue), 654
Tenders, 24, 44, 75, 105, 134, 167, 227, 265, 290, 321, 352, 414, 446, 479, 484, 541, 572, 639, 668, 739, 773, 805
Time Recorders (Catalogue), 464
Trevithick's Cottage, 163
Truck and Trolley Wheels (Catalogue), 182
Tunnel, Vehicular, under Detroit River, 637
United States, Fuel Oil Consumption, 240
Water Power of the World, 206
Welding (Catalogues), 182, 306, 399
Welfare Organisation, Stewart & Lloyds, 121

Motor Cars, &c. :

Alberta, Motor Vehicles in, 630
American Automobile Industry, 758
Bombay, Registration of Motor Cycles, 772
Brakes, Air (Catalogue), 654.
Buenos Aires Motor Show, 805
Canadian Automobile Production, 817
Cars, Motor (Catalogue), 623
Commercial Vehicle Industry, U.S.A., 227
Exhibitions, Motor, Confidential Reports, 606
French Foreign Trade, 754
'Iraq, Motor Vehicles in, 526
Lithuania, Motor Vehicles in, 811
Lorries, Motor, Annual Parade, 167
Motor Users' Association, Commercial, 383
New Zealand, Motor Cycle Trade with, 555
New Zealand, Motor Vehicle Imports, 607
Night Signs for Motorists, 400
Palestine, Motor Cycle Trade with, 550
Petrol and Oil Measures (Catalogue), 756
Philadelphia Motor Show, 265
Pumps, Petrol, Verification, &c., 526
Stuttgart as a Motor Market, 295
Tractor, International, Trial, 134
Tractors (Catalogue), 306
Valves, Steel, for Motor Vehicles (Catalogue), 399
Wagon, Steam (Catalogue), 119
Zagreb Spring Fair, 821.

Naval :

Chilean Destroyers, Launch, 321, 638
Destroyers, Contracts for, 227, 259
Dutch Destroyer, 638
"Osiris," H.M.S. Submarine, Launch, 644
Submarines, British, Contracts for, 175
"Sussex," H.M. Cruiser, 232

Obituary. See GENERAL INDEX

Physics and Chemistry :

Chemical Engineering and Chemical Catalogues, 555
Chemical Industry Conference, *Erratum*, 665
Laboratory Chemicals (Catalogue), 756
National Physical Laboratory Report, 415
Ramsay Laboratory Extension, Appeal, 383
Rubber, Synthetic, 149

Power Plants. See *Electricity*

Power Transmission :

Bearing Metals (Catalogue), 654
Bearings, Ball and Roller (Catalogues), 30, 399
Chains, Driving (Catalogue), 623
Gears, Reduction (Catalogue), 756
Gears, Spiral Bevel (Catalogue), 654
Hoffmann Ball Bearings, 588
Pulleys, Wrought Steel Rim, 235
Shafts, Flexible (Catalogue), 654
Timken Bearings, 746
Worm Gearing (Catalogue), 306

Railways and Locomotives :

Bradshaw's Railway Guide, 618
Canadian Railway Statistics, 637
China, Rolling Stock for, 175
Crewe Locomotive Works, *Errata*, 414
Electric Railway Equipment, Standardisation, 52
Electricity on Railways, Early Use of, 45
Fish Plates, Steel, Standard, 340
Great Western Ports, Handbook, 11
Locomotives (Catalogues), 306
London Underground Railways, New Escalators, 714
London Underground Railway and Omnibus Guide, 813
Materials, New, in Railway Work, *Erratum*, 739
Mukden General Railway Station, 163
New Zealand Railway Material, 135
Officials, Railway, Universal Directory, 677
Platform, Movable, London Underground, 424
Railway Year Book, 607
Rolling-Stock Equipment (Catalogue), 399
Signalling, Colour-Light (Catalogue), 588
Signals, Railway (Catalogue), 756
Superheating, Locomotive (Catalogue), 588
Train Control, Automatic, Investigation, 52
Transandine Railway, 103
Trans-Saharan Railway, 773
Wagons, Wagon (Catalogue), 182.

Schools. See *Education*

Sewage and Drainage :

Chile, Sewage Disposal in, 748
Hotels, Sanitary Accommodation, &c., 32

Ships and Shipbuilding :

"Anglo-Canadian," M.S., Launch, 724
"Antigone," S.S., Launch, 659
"Apure," S.S., Launch, 664
"Ardour," S.S., Launch, 615
"Bactria," S.S., Launch 340.
"Baharistan," S.S., Launch, 553.
Bauer-Wach Exhaust Turbine Drive, 206
"Beaverbrae," T.S.S., Trial Trip, 424
"Beaverford," S.S., Trials, 185
"Beaverhill," S.S., Trial Trip, 368
"Belpamela," M.S., Trial Trip, 312
Breathing Apparatus for Ship Use, 142

Ships and Shipbuilding—*continued.*

"Brighton," S.S., Launch, 75
British Corporation Rules and Tables, 738
"British Honour," M.S., Launch, 447
"British Justice," M.S., Launch, 447
"Brons," Motor Tug, Trials, 670
Canadian Lake and Canal Steamers, 165
Cardiff Shipping Statistics, 415
"Caroni," S.S., Trial Trip, 754
"Catatumbo," S.S., Launch, 447
"Ceylon Bul-Bul," S.S., Launch, 227
"Chesapeake," M.S., Trials, 622
"City of Canberra," S.S., Trial Trip, 37
Clyde Activities, 15, 104, 197, 259, 383 415, 447, 541, 607, 639, 705, 773
"Coptic," M.S., Launch, 338
Crane, Floating, 125-ton, South Wales Ports, 614
"Curl-Curl," S.S., Launch, 368
Davits, List-proof Boat, *Addendum*, 541
"Dee-Why," S.S., Launch, 276
"Duchess of Bedford," *Addendum*, 711
"Eastborough," Trial Trip, 235
"Elsa," M.S., Launch, 459
"Euterpe," Repair Contract lost to Wales, 105
"Goodwood," S.S., Trial Trip," 743
"Greystoke Castle," M.S., Launch, 75
"Groningen," S.S., Launch, 243
"Jadwiga," T.S.S., Launch, 628
"King Edwin," M.S., Trial Trip, 59
"King John," M.S., 30, 226
"King Lud," M.S., Trial Trip, 424
"King Neptune," M.S., 149, 511
"King William," S.S., Launch, 729
"Lady Charlotte," Repair Contract Lost to Wales, 167
Launching Gear, Ships' Boats (Catalogue), 588
Lifeboats, Ships', Wireless Telegraphy, 424
Lloyd's Returns, 372
Marking of Vessels, B.O.T. Exemption, 487
Machinery Output, Marine, 1927, 75, 105
"Mataco," S.S., Trial Trip, 521
"Mansepool," S.S., Trials, 240
"Muncaster Castle," M.S., Launch, 507
"Oltenia," S.S., 480, 598
Panama, Tank Ship Traffic, 443
"Quebec City," S.S., Trial Trip, 116
Rangoon, Fire and Salvage Boat for, 550
"Rio Diamante," S.S., Trial Trip, 619
"Riverton," S.S., Trial Trip, 746
Scotch Shipbuilding, 15, 45, 104, 134, 197, 259, 383, 415, 447, 478, 541, 607, 639, 705, 773
"Scottish Chief," S.S., Trial Trips, 766
"Scottish Heather," S.S., Launch, 447
"Sea Belle II," Trial Trip, 131
Shipbuilding in 1927, 15, 74
"Sir William H. Raeburn," S.S., Launch, 669
Tees and Hartlepool Shipbuilding Association, 382
"Thirlby," S.S., Trial Trip, 308
"Toftwood," S.S., Trials, 250
"Vancolite," M.S., Launch, 375
"Wanda," S.S., Launch, 748
"Yamanota," S.S., Launch, 748
"Yarraville," S.S., 306, 487
"Zealandic," M.S., Trial Trip, 491

Societies. See *Technical* and *Trade*

Strikes. See *Trade Societies*

Technical Societies, &c. :

Aeronautical Society, Royal, 193, 209, 287
American Society for Testing Materials, 129
Arts, Royal Society of, 53, 182
Automobile Engineers, Institution of, 478
Bituminous Coal, Conference, 4, 821
Bradford Engineering Society, 713
Bridge and Structural Engineering Congress, 804
British Association, 615
British Electrical Development Association, 739
Carbonisation, Conference on, 75
Chemical Industry Conference, 540
Chemistry, Institute of, 52
Civil Engineers, Institution of, 573
Civil Engineers, Institution of, Conference, *Addendum*, 814
Consulting Engineers, Association of, 821
Consulting Engineers, International Federation, 804
Diesel Engine Users' Association, 74
Electrical Engineers, Institution of, 74, 111, 174, 197, 257, 290, 317, 443, 638, 665, 736
Fuel Congress, French Industrial, 148
Fuel, Institute of, 588
Finsbury Technical College Old Students, Association, 202
Gas Engineers, Institution of, 484, 691
German Wagon Builders' Association, 209
Glass Technology, Society of, 351
Heating and Domestic Engineers, Master, National Association, 383
Illumination, International Commission, 480
Iron and Steel Institute, 192, 206, 424
Iron Trade Employers' Insurance Association, 669
Junior Institution of Engineers, 382, 549
Locomotive Engineers, Institution of, 541
Manchester Association of Engineers, 113, 392
Marine Engineers, Institute of, 236, 336
Mechanical Engineers, Institution of, 290, 414
Mechanical Engineers, Institution of, Yorkshire Branch, 209
Metals, Institute of, 69, 196, 573, 637
Mining and Metallurgy, Institution of, 411
Municipal and County Engineers, Institution of, 317, 479
Municipal Electrical Association, Inc., 698
Naval Architects, Institution of, 265, 303, 321, 352, 573, 606, 804
Newcomen Society, 639
Old Centralians, 227

Technical Societies, &c.—*continued.*
Patentees, Institute of, 212
Peat Congress, International, 606
Public Lighting Engineers, Association of, 447
Radiology, British Institute of, 676
Railway Signal Engineers, Institution, 172
Sanitary Institute, Royal, 9, 32, 518
Scientific and Learned Societies, Year Book, 368
Structural Engineers, Institution of, 392
Supervising Electrical Engineers, Association of, 316, 479
Surveyors' Institution, 557, 684
Transport, Institute of, 144, 268, 352
United States National Academy of Sciences, 615
Water Engineers, Institution of, 414
Water Users, National Association of, 32
Waterworks Association, British, 581
Westinghouse Association, Ex-British, 336

Telephony. See *Electricity*

Tools. See *Machine and Other Tools*

Trade Societies :
Admiralty, Yard Craft Workers, Wages Demand, 648
Appleton, W. A., on International Peace and Economic Understanding, 193
Appleton, W. A., on Washington Hours, International Aspect, 744-5
Arbitration, Australian and Indian Criticism, 443
Australia, Mr. Bruce on Conference of Employers and Employed, 176, 267, 287, 349, 537
Australian Employers' Criticism of Arbitration, 443
Australia, Industrial Mission on United States Labour Conditions, 176
Austrian Chambers of Manual and Non-Manual Workers, Functions, 814
Belgian Trade Union Committee's Demands, 712
Berlin Engineering Trade Stoppages, 287
Betterton, Mr., on Revising Draft of Washington Hours Convention, 176
Blastfurnacemen, Wages, 44, 446
Boilermaker's Society on Clyde Riveter's Settlement, 143
Boilermakers' Society, Mr. Hill on the Unscrupulous Section, 267
Boilermakers' Society, Membership and Benefit Data, 143, 267, 392, 520, 712, 781
Boilermakers' Society, Report, 392
Boilermakers' Society, Repudiation of Communists, 392, 488, 537
Boilermakers' Society, Veto on Communist Representatives, 349, 781
Bulgaria, Engineers and Architects, Improvement Resolutions, 582
Canada and Co-operation between Employer and Employed, 781
Capital, Ownership by Many or Few, T.U.C. Views, 176
Cellulose Lacquers, T.U.C. Conference, Proposed, 781
Civil Servants, Programme of Demands, 143
Clyde Riveters' Settlement and Boilermakers' Society, 143
Coal Industry, Independent Labour Party's Demands, 443
Commercial, Clerical and Technical Employees' Federation, Membership, 781
Cotton Industry, Lancashire, Conference Proposals, 23, 53.
Cotton Spinners' Federation, Proposed Wage Reduction, 582, 648
Cotton Trade Conference, 70, 100, 176, 236, 267, 287, 488, 520, 537
Cotton Trade Conference, Communistic Incitements, 488
Cotton Trade Conference, Workers' Attitude, 70, 100, 176, 236, 267, 287
Cotton Trade Operatives, Wages and Hours Contentions, 537
Cotton Trade Trouble and Minority Movement, 100
Cotton Trade, Workers' Reply to Conference Reports, 520
Dyers' Executive and Piece-Work Question, 267, 537, 582, 648, 745-6, 781, 814
Electrical Trade Wages Agreement, 143
Electricians, Railway, Wages Award, 648
Employers and Employed, Mr. Cramp on Collective Responsibility, 537
Employment Exchange Reports, 23, 53, 70, 100 (2), 143, 176, 193, 236 (2), 267, 287, 330, 392, 423, 520, 582, 616, 665, 744, 781
Engineering Trade Wages, London Workers' Demand, 537
Engineering Trade Wages Question, 70, 143, 192, 267, 330, 349, 488, 537
Engineering Trade Wages, Sir Allan Smith on the Position, 537
Engineering Union, Amalgamated, Adverse Criticisms of Council, 443
Engineering Union, Amalgamated, Agreement with Miners' Federation, 616
Engineering Union, Amalgamated, and Avoidance of Disputes, 745
Engineering Union, Amalgamated, Communists and Election of Officers, 443, 582
Engineering Union, Amalgamated, Election Activities, 443
Engineering Union, Amalgamated, Finance, 616
Engineering Union, Amalgamated and Local Applications for Wage Advances, 665
Engineering Union, Amalgamated and Machinists' Pay, &c., 616
Engineering Union, Amalgamated, Membership, 53, 192, 349, 488, 582, 616, 745, 781
Engineering Union, Amalgamated, and Minority Movement, 330
Engineering Union, Amalgamated, and Overtime, &c., Agreement, 616
Engineering Union, Amalgamated, Payment for Holidays Questions, 745
Engineering Union, Amalgamated and Payment by Results, 648, 665
Trade Societies, &c.—*continued.*
Engineering Union, Amalgamated, Re-election of Mr. Brownlie, 423, 537
Engineering Union, Amalgamated, Re-election of officers, 582
Engineering Union, Amalgamated, Report, 349
Engineering Union, Amalgamated, Repudiation of Communists, 665
Engineering Union, Amalgamated, Retirement of Officers, 53, 192
Engineering Union, Amalgamated, on Trade Prospects, 330
Engineering Union, Amalgamated, Wage Rates Question, 616
Engineering Union, Amalgamated, and Washington Hours, 330, 665
Engineering Union, Amalgamated, and the York Memorandum, 665
Engineering Union, National Committee, and Employers' Industrial Conference Proposals, 616
Engineering Union, National Committee, and Peace in Industry, 616, 665
Engineers, Professional, Paris Conference of Organisations, 287
Factory Workers, U.S.A., Decreased Employment, 423
Fascist Labour Contract, Metallurgical Trade, 267, 330
Federation, General, of Trades, Financial Position, 745
Federation of Trades, International, Legislation Questionnaire, 814
Federation, General, of Trades, Report, 582
Federation, General, of Trades, and Washington Hours, 744-5
Finnish State Council and Non-Applications of Eight-Hour Day, 330
Foremen (Engineering Trades) and the T.U.C. Affiliation, 665
Foremen, Training of, United States Practice, 648
France, Reciprocity Question in Employment of Foreigners, 582
French Communists, Strike Tactics, 537
French Engineers', Federation of Associations, and Rationalisation, 582
French Engineers' Organisations, 582
French Labour Confederation, General Demands, 23
French Labour Confederation and Rationalisation, 23
French Minimum Wage, Proposed Legislation, 53
Friendly Society Statistics, 53
General Council, T.U.C., Mr. Citrine on Minority Movement, 520
General Council (T.U.C.) and Notts Coalowners, 392, 423
General Council (T.U.C.), and the Peace Movement, 143, 267, 287, 330, 582, 648, 814
General Council (T.U.C.), Peace Movement Position, Explanation, 267
General Council (T.U.C.), Repudiation of Unemployed Workers' Committee, 287
General Council (T.U.C.) Unemployed Workers' Scheme, 330
General Council (T.U.C.), and Voluntary Agreements, 520
Geneva Conference, British Government and Washington Convention, 745
Geneva Conference, Decreased Production, Collection of Remedial Data, 814
Geneva Conference, I.L.O. and Washington Hours, 176, 267
Geneva Labour Conference, and Prevention of Accidents, 712
German Engineering Trade Stoppages, 287
German Metal Manufacturers, Threat of Lock-out, 193, 236, 330
German National Economic Council, Constitution, &c., 814
German Steel Industry Difficulties, Deductions by "Man and Metal," 53
German Steel Industry, New Regulations, Dr. Reichert's Views, 443
Germany, Ruhr Coal Dispute Award, 520
Germany, Unemployed in Receipt of Relief, 23
Germany, West, Threatened Labour Difficulties, 488
Hours of Industrial Employment Bill, 287
Hours of Work Changes, 1927, 520
Hours of Work, Labour Ministry Report, 100
Hours of Work, Washington Convention, Proposed Revision, 176, 537
Hunter, Sir George, Emigration Scheme for Unemployment, 665
India and Ceylon Chambers of Commerce on Arbitration, 443
Industrial Notes. See *Labour Notes* (below)
Industrial Peace and Economic Understanding, Mr. Appleton's Views, 193
Industrial Peace Economics, Sir L. Macassey on, 143
Industrial Peace Movement Conference, 70, 100, 392
Industrial Peace Movement, Conference Committees, 100
Industrial Peace Movement, Divisions of T.U.C. Agenda, 330
Industrial Peace Movement and Independent Labour Party, 176, 488
Industrial Peace Movement, Patternmakers' Views, 392
Industrial Peace Movement, Scottish Independent Labour Attitude, 23, 53
Industrial Peace Movement, and T.U.C. Council's Authority, 143
Industrial Peace, Mr. A. J. Cook's Opposition, 143, 330
Industrial Questions, Plea for More Scientific Treatment, 192
Industrial Situation, 100, 236, 349, 488, 781
Insurance, Employers' Liability, Statistics, 70
International Labour Organisation and Washington Hours, 176, 267
International Labour Ratifications, 23
Irish Railwaymen, New Entrants, Wages Award, 53
Trade Societies, &c.—*continued.*
"Iron International" Press, 193
Iron and Steel Trades Confederation on the Rating Proposals, 712
Iron and Steel Trade Wages, 134, 383
Ironfounders, Light Casting, Federation, Reduction of Wages, 616, 665
Ironstone Miners' Wages, 44
Italian Iron and Steel Trade Wages and Hours, 267, 330
Italy, Labour Disputes, New Regulations, 537
Italy, Restriction of Trade Union Congresses, 143
Labour Ministry Reports, 23, 53, 70, 100 (2), 143, 176, 193, 236 (2), 267, 287, 330, 349, 392, 423 (2), 488, 520 (2), 582, 616, 648, 665, 744, 781
Labour Notes, 23, 53, 70, 100, 143, 176, 192, 236, 267, 287, 330, 349, 392, 423, 443, 488, 520, 537, 582, 616, 648, 665, 712, 744, 781, 814
Labour Party, Independent, and Abolition of Capitalism, 488
Labour Party, Independent, and the Coal Industry, 443
Labour Party, Independent, and Living Wage Question, 443
Liberal Party's Industrial Programme, Strike Question, 176
Living Wage Inquiry, Outline and Its Practicability, 23
Living Wage Question and the I.L.P., 443
Macassey, Sir L., on Economics of Industrial Peace, 143
"Man and Metal," on Capitalism in America, 287
"Man and Metal," on Punitive Tests of Unemployed, 582
Managerial Rights, T.U.C. General Council on, 176
Metal Workers, International, Development of Press, 193
Minimum-Wage Fixing Machinery, International Labour Proposals, 287
Minority Movement and Cotton Trade Trouble, 100
Minority Movement, Militant Programme 582
Minority Movement and Peace in Industry, 23
Minority Movement and Union Discipline, Mr. Citrine's Comments, 814
Miners and Elimination of Non-Political Unions, 23
Miners' Federation, International, and Russian Mineworkers, 712
Miners' Federation, International, and the Washington Hours, 712
Miners' Federation and the Minority Movement, 648
Miners' Federation and the Mond Movement, 648
Miners' Federation and the Notts Miners, 192
Miners and Municipal Workers, Membership Question, 23
Minimum Wage-Fixing Machinery and International Labour Conference, 781
Mond Movement. See *Industrial Peace*
Motor Drivers (International), Demand Programme, 143
Municipal Workers and Miners, Membership Question, 23
Municipal Workers and the Motor Car Industry Members, 746
Negotiation, Machinery of, Scottish T.U.C., 520
New York State, Industrial Position, 236
Night Work, T.U.C. General Council's Circular, 781
Notts Miners, Appeal to Miners' Federation, 192
Notts Miners, T.U.C. Ballot on Representation, 582
Overtime and Nightshift Agreement and Engineering Union, 616
Paris, Professional Engineers' Conference, 287
Pattern Makers and Agreement with Engineering Employers, 70
Pattern Makers, Executive Council, 193
Pattern Makers and the Industrial Peace Movement, 392
Pattern Makers, Mr. Findlay on Overtime, 193
Pattern Makers, President's Counsel on Wages Demands, 488
Pattern Makers and Reduction of Contributions, 746
Pattern Makers, Reports, 70, 193, 349, 423, 488, 616
Peace Movement and the Scottish T.U.C., 520
Piecework Question, the Scottish T.U.C., 520
Poland, Working Hours Revision, 236
Polish Patents and Protection, Workmen's Inventions, 712
Polish Strikers, Indemnity Claim Upheld, 423
Post Office Workers' Union, Secession from Whitley Council, 712
Printing Trade Betterment Committee's Objectives, 70
Professional Workers' Federation and Industrial Peace, 176
Railway Electricians, Wages Award, 648
Railway Shopmen's Council, Representation, 192
Railwaymen, National Union, Finance and Recuperative Power, 745
Railwaymen, National Union, Gateshead Branch and Mond Movement, 392
Railwaymen, National Union, and the Irish Claims, 443
Rating Proposals, "Man and Metal," on, 712
Rationalisation, French Federation of Engineers' Associations, 582
Russia, Soviet Commissariat and Unemployed Relief, 814
Russian Central Trade Council and Administration Expenses, 176
Russian Central Trade Council and Economic Policy, 143, 176
Russian Trade Union International, Criticism of "Red" Unions' Inactivity, 712
Trade Societies, &c.—*continued.*
Russian Textile Workers' Union on Defective Administration of the Industry, 712
Skilled Employment and Apprenticeship Association, 711
Scottish Independent Labour Party, Hours and Wage Proposals, 23, 53
Scottish Independent Labour Party and Nationalisation of Mines, 23
Scottish Mine Workers' Union and Communism, 520
Scottish T.U. Congress and Machinery of Negotiation, 520
Scottish T.U. Congress and the Peace Movement, 520
Scottish T.U. Congress and the Piecework Question, 520
Scottish T.U. Congress and Regulation of Wages, 520
Shipbuilding Industry, Independent Chairman of Conferences, 423, 781
Shipbuilding Trade Wages, Employers' Offer and Conditions, 236
Shipbuilding Trade, Wages Question, 70, 143, 236, 349, 423, 665, 712
"Socialism-in-our-Time" and Scottish Independent Labour Party, 53
Sowerby Bridge Co-Operative Society and Employees, 143
Strikers' Piecework Earnings Question, 330
Strike Statistics, 100, 236, 349, 488, 648, 781
Taxation Burden, Local, Suggested Royal Commission, 424
Textile Finishing Trades Dispute, 267, 537, 582, 648, 745-6, 781, 814
Trades Councils, Position under Trades Union Act, 1927, 349
Trade Union Act, 1927, T.U.C. Summary of Trades Council's Position, 349
Trade Union Congress and Managerial Rights, 176
Trade Unions, Canadian View of Responsibilities, 781
Trade Unions, Friendly Society Statistics, 53
Trade Unions, T.U.C. Questionnaire on Amalgamation, 70
Turner, Mr. B., on Defence of T.U.C. General Council, 582
Unemployed, Punitive Tests of, "Man and Metal" Views, 582
Unemployed Workers, General Council (T.U.C.) Scheme, 330
Unemployment Benefit, New Conditions, 520
Unemployment Burden, Employers' Demand for Analysis, 349
Unemployment Burden, Labour Ministry s Analysis, 423
Unemployment Insurance Act, New, Labour Ministry Comments, 520
Unemployment Reports, 23, 53, 70, 100 (2), 143, 176, 193, 236 (2), 267, 287, 330, 349, 392, 423 (2), 488, 520, 582, 616, 648, 665, 744, 781(2)
Unemployment, Sir George Hunter's Proposals, 665
Unemployment, Technical Processes as a Cause, 287
United States, Factory Workers, Decline in Number, 423
United States, Federation of Labour and Unemployment Insurance, 814
United States Labour Conditions, Australian Mission Reports, 176
United States Machinists' Association, International and Five-Day Week, 814
United States, New York, State Industrial Position, 236
United States, Prospective Industrial Revolution, 287
United States Scientific Production and the Worker, 423
United States, Training of Foremen in, 648
United States Unemployment, Labour Agencies' Reports, 443
United States, Unemployment in New York State, 236
United States Unemployment, Remedial Proposals, 814
United States, Unemployment Statistics, Inaccuracies and Imperfections, 392
United States, Influence of Scientific Production on American Workers, 423
Wages, Fluctuation of, 100, 236, 349, 488, 520, 648, 781
Wages, Regulation of, Scottish T.U.C., 520
Washington Hours, Netherlands, Ratification Question, 23
Washington Hours Ratification, A.E.U. on, 330, 665
Washington Hours, Ratification Question, 100, 176, 267, 330, 537, 665, 744-5
Washington Hours Ratification and Scottish T.U.C., 392
Welsh Coal Trimmers' Night Work, Abolition Question, 134
Welsh Miners' Wages, S. Wales Board, 15
Woodworkers, Amalgamated Society, Report, 648
Workers, American, Influence of Scientific Production, 423
Workmen's Compensation Statistics, 70

Trade. See *Coal ; Iron and Steel ; Ships and Shipbuilding ; Electricity ;* and *Industries*

Tramways :
Glasgow Corporation, Operation, 22
Granada, Electric Tramline, Equipment, 715
Poles, Tubular, Standard, 228
Trackwork, Standard, 623

Turbines. See *Engines and Boilers*

Universities. See *Education*

Vehicles. See *Motor Cars ; Railways*

Warships. See *Naval*

Waterworks :
British Waterworks Association, 582
Concrete Conduits, 202
Water Users' Association and Legislation, 32

LONDON:

Printed for the Proprietors by HARRISON & SONS, LTD., at the BEDFORD PRESS, 20 & 21, Bedfordbury, in the Parish of St. Martin's-in-the-Fields, and Published by CHARLES ROBERT JOHNSON, at the Offices of "ENGINEERING," 35 & 36, Bedford Street, in the Parish of St. Paul, Covent Garden, both in the County of Middlesex.—Friday, July 27, 1928.